

7-2017

# Instructional Technology: An Alternative Solution to Promoting Achievement in Remote Rural High Schools

Eva Mitchner Jenkins

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INSTRUCTIONAL TECHNOLOGY: AN ALTERNATIVE SOLUTION  
TO PROMOTING ACHIEVEMENT IN REMOTE RURAL HIGH SCHOOLS

By

Eva Mitchner Jenkins

Columbus State University  
Columbus, GA

July 2017

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## DEDICATIONS

This dissertation is dedicated to my family. My mother, Lillie, my sons, Kaelin and Austyn. My completion of the doctoral program would not have been possible without their encouragement and support. I love all of you and am blessed to have your support.

## ACKNOWLEDGEMENTS

I wish to acknowledge our Heavenly Father for opening doors for me throughout my life and career and enabling me the opportunity to further my education. Thanks for answering the many prayers you heard throughout my life.

I would like to sincerely acknowledge the individuals and organizations whose effort and support made this dissertation possible. From the Columbus State University, College of Health and Education Professions, a special thanks to my committee Chairperson, Dr. Michael D. Richardson, who understood my fight and plight in life and stood by me every step of the way. My committee members Dr. Thomas Hackett and Dr. Pamela Lemoine, for offering constructive criticism that guided me through this process. The school district where this study was conducted for unconditionally, providing me with the opportunity to conduct this study.

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## ABSTRACT

The inauguration of federal government policies assuring that all students attending public schools in the United States have equal access to a highly qualified education, sparked national attention on improving the performance of rural schools and districts. Consequently, one in ten students is educated in remote school districts, and a large number of remote rural districts serve students that are minorities and poor. In many instances, the talents and abilities of the students served in rural schools and districts are less likely developed or noticed when compared to urban and suburban school districts. For administrators of remote rural high schools, finding ways that provided a quality education, often, had to come at a low cost. Since, the use of technology for instruction are cost efficient, effective and had the potential to replace or supplement traditional classroom instruction; many remote rural schools found its use promising (Irvin, Hannum, Banks, Farmer & Keane, 2009). The purpose of this study was to explain the extent to which using instructional technology influenced the operation of an isolated rural high school and the extent to which, technology impacts student achievement. The study focused on one relative isolated rural public high school located in the southern part of the United States, which served students in grades nine- through twelve, regular and special education, and compulsory programs. A qualitative case study method that used instruments such as interviews, observations, documents, and archival records collected data for the study. The data collected enabled the researcher to capture and provide a rich description of the events that occurred at the site in an effort to answer two central

research questions; a) given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school? b) To what extent does the use of technology in isolated rural high schools impacts students' achievement? Themes identified from the analysis of findings were (a) the culture and climate of the school, (b) the role of instructional technology, (c) the outcomes of using instructional technology, and (d) resource requirements. Findings of data revealed that the practice of incorporating technology in an isolated rural high to manage the school and for teaching and learning yielded positive results. Results of findings indicated that technology had positively influenced the school culture and climate, enhanced the proficiency of the operational practices of the school, and improved the effectiveness of the instructional practices of the school. The incorporation of instructional technology had a positive impact on the student achievement. The school experienced an improvement in the student academic behavior, preparation for college, preparation life, and credentials for careers.

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## CHAPTER I

### INTRODUCTION

The inauguration of federal government policies assuring all students attending public schools in the United States equal access to a highly qualified education (McMillan, 2012) sparked national attention on improving the performance of rural schools and districts. One in ten student are educated in remote school districts; a high proportion of remote rural districts serve students that are minorities and poor. The talents and abilities of the students served in rural schools and districts are less likely to develop when compared to urban and suburban schools and districts (Hill, 2015). In response, school administrators, and policymakers struggle to find solutions for providing a good education and improving the students attending achievement. However, Jennings (2012) pointed out the outcomes of implementing many of the interventions have been inconsistent; some schools have experienced improvement, some have remained the same, and others have gotten worse. Nevertheless, Brown and Swanson (2003) suggested that regardless of what interventions, program, or treatment was implemented, some remote rural school systems are still not successful.

Educational policymakers, often blame school administrators, when in fact, the utmost concerns for administrators of remote rural schools is improving students' achievement. Finding ways to provide a quality education for their students can be taxing, especially in remote rural areas, because, so many variables can influence student

achievement (United States Department of Education, 2013). In light of this, the decisions made by administrators of remote rural schools regarding the operation of the school and student achievement are crucial to the success or failure of the school as well as the students. Consequently, if decisions do not lead to improvement, the administrators face sanctions, such as the transformation of the school, loss of trust of the community, parents, and students' confidence in the school and school closure (Flynn, 2008). To truly understand the disposition of remote rural school administrators, and why even the most common decision regarding the operation of the school and student achievement can be difficult to make, it is necessary to have an understanding of the implications of being a rural school, located in an isolated area.

In the United States, more than one third of all public schools are located in rural areas (Provasnik, Kewal, Coleman, Gilbertson, Herring, & Xie, 2007). In addition, Johnson (2006) suggested that due to their locality, remote rural schools face issues in education, which hinders the students' opportunity to experience learning. The unique characteristics of isolated rural areas influence the economy in the area: funding and resources for education are often not readily available. Furthermore, isolated rural area's ability to support the needs of the people, provide employment, transportation and other resources impacts educational resources. The inability of the area to support the needs of the people affects the people who live in the area. If the area is poor, the people living there may be poor as well, which in turns, influences their attitude toward life and behaviors concerning learning and education in general (Khattri, Riley, Kane & Pelavin, 1997). Ashtron and Duncan (2012) reported administrators of remote rural high schools

encounter issues stemming from the conditions of the environment that inhibit the ability of the school to function adequately. These issues give rise to problems with funding, recruitment and retention of qualified teachers, community and parent involvement, motivation, technology and student achievement (Preston, Jakubiec & Kooymans, 2013).

Amidst the fact that administrators of rural schools face many issues, often finding a solution that eliminates many of the barriers, as well as meeting state and federal education guidelines can be taxing. One solution to resolve the issues faced and promote students' achievement is with technology for teaching and learning.

Instructional technology incorporates the use of computer-based programs, multimedia materials, networks and communications systems to support teaching and learning in school. Using technology allows rural school systems the opportunity to offer additional courses, deliver instruction in an alternative way, accommodate more students, provide more resources, ease budget restraints, improve data collection and analysis and improve student achievement (Pitler, Hubbell & Kuhn, 2012). In fact, some rural school systems in the United States would not be able to provide students with the resources needed to be successful in school, life, college, and careers without using technology. Technology allows options not otherwise available; however, isolated rural school administrators have concerns about the effectiveness of technology on student achievement.

Lacour and Tissington (2011) believe the locality of the school is one of the major factors that influence students' achievement. Rural areas in southern states have the lowest achievement scores, perhaps, due to the influence of the environment, the people,

and the community (Farrigan, 2012). The most prevalent reason is the unique characteristics of the locality impede the educational process in the area (Redding & Walberg, 2012). Snyder (2012) stated that using technology in isolated rural high schools raises some concerns, considering the fact that, some remote rural high schools are lagging behind when compared to non-rural high schools. Nonetheless, school districts located in isolated rural areas, have to trust technology, though its effect on students' achievement has not clearly been determined (Pedro, 2012).

The reasons why some rural schools are lagging behind (Marre, 2014) are complex. Nevertheless, educational policymakers continue to impose the same sanctions on successful and unsuccessful schools, in spite of evidence suggesting that sanctions are not in the best interest of remote rural schools. Some of the sanctions add to disadvantages for remote rural schools. For administrators of remote rural high schools, finding ways to provide a quality education, often, has to come at a low cost. The use of technology for instruction is cost efficient, effective, and has the potential to replace or supplement traditional classroom instruction; many remote rural schools find its use promising (Irvin, Hannum, Banks, Farmer & Keane, 2009).

## Statement of Problem

Few studies have addressed using technology to promote student achievement in remote rural schools. Remote rural high school administrators in their quest to prepare students for success in life, college, and careers, often rely on technology to address state accountability measures and provide students with a good quality education.

Sanctions placed on schools not in compliance with federal and state regulations may have a profound effect on all aspects of education, students, parents, teachers, community, and school. The unique characteristics of the geographical location of some rural areas create problems for education, such as; funding, recruitment and retention of teachers, parent and community involvement, students' motivation to attend school, and technological resources which influence student achievement.

The use of instructional technology has gained popularity in remote rural high schools. In many cases, the challenges faced by remote rural school districts can be ameliorate by using technology. Relying on technology provides administrators of remote rural high schools a method to seek remedies for their unique circumstances and increase student achievement. The researcher aims to answer questions pertaining to how the incorporating of instructional technology in an isolated rural high school supports the achievement of the students' attending school.

## Research Questions

The research questions are:

1. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school? The researcher will answer this question by describing how one isolated rural high school use technology.
2. To what extent does the use of technology in isolated rural high schools impact students' achievement? The researcher will describe how using technology influenced the students' performance on test and in school.

## Definitions

**Asynchronous Online Learning:** Using technology for learning that takes place over the Internet without a teacher.

**Hybrid or Blend Online Learning:** Using technology for learning that takes place over the Internet in combination with and without a teacher.

**Internet:** A communications network that connects personal, wireless, and organizational computer network facilities around the world.

**Instructional Technology:** Computer-based learning, multimedia materials, networks and communications systems to support teaching, learning and assessment school.

**Online Learning:** Using technology for learning that takes place over the Internet, whether partially or fully.

**Remote Rural Schools Districts:** The proximity of the school districts being approximately thirty miles away from an urban or suburban area, a school population of less than 600 students.

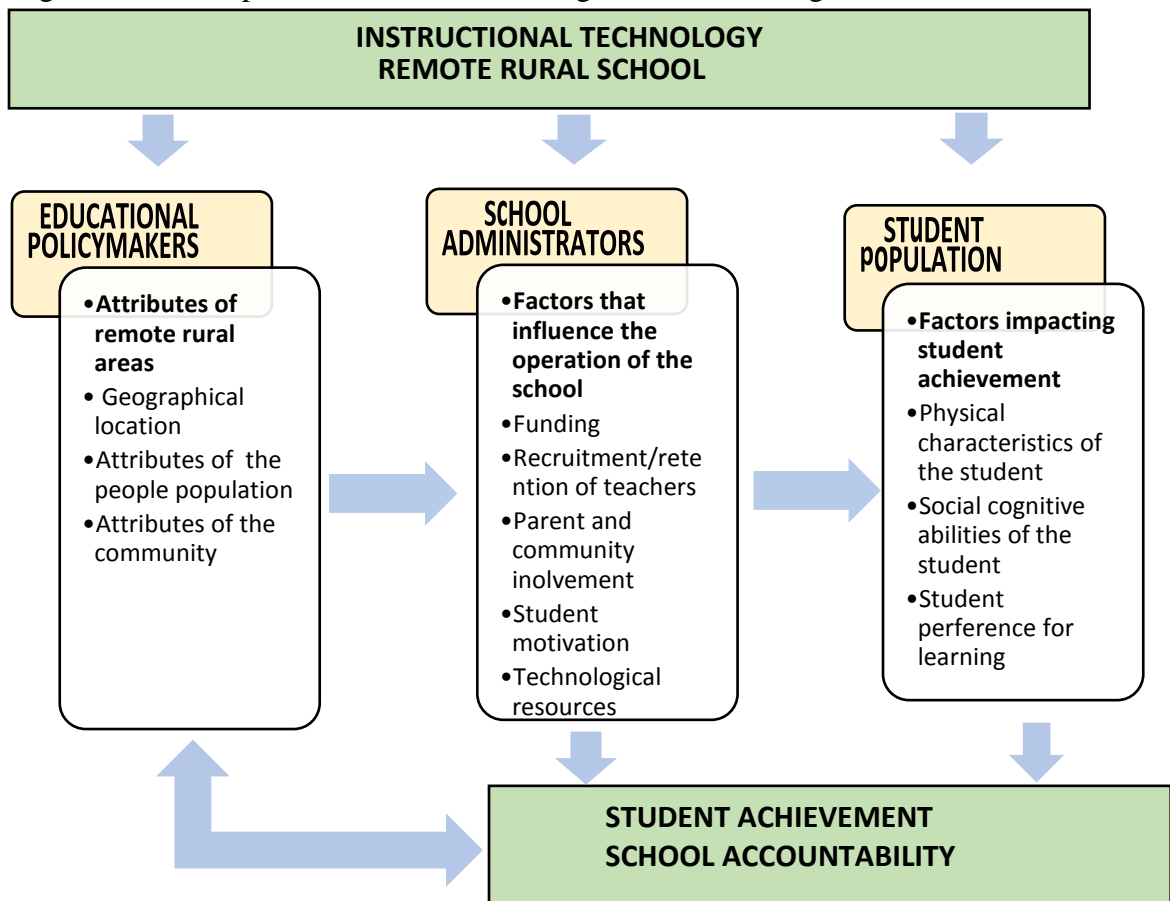
**Remote Rural High School:** A school located in an isolated area, accommodating grades 9-12.

**Remote Rural High School Students:** Students enrolled in grades 9-12 in a remote rural high school.

Synchronous Online Learning: Using technology for learning that takes place over the Internet with a teacher.

## Conceptual Framework

Figure1: A Conceptual Framework Outlining Factors Affecting Remote Rural Schools



As Figure 1 illustrates, isolated rural schools with limited resources encounter factors that affect the operation of the school and student achievement, thus influencing school accountability. Administrators are concerned with funding, recruitment, and retention of teachers, parent and community involvement, motivation and technological

resources, all which influence the function of the school. For students, issues arise that impact their success in school. When isolated rural high school administrators examine the use of instructional technology three areas are key concerns: a) attributes of remote rural areas, b) attributes of the population and c) attributes of the community. These areas play an important role in understanding how using instructional technology influence the operation of the school, student achievement thus the school's accountability.

Many administrators of isolated rural high school incorporate the use of instructional technology into their educational practices. The factors encountered in isolated rural areas that affect the operation of the school and student achievement is addressed with instructional technology. However, the extent to which the use of instructional technology influence the operation of the school and the extent to which the use of instructional technology impact student achievement depend on how the technology is used to address the attributes of the geographical location, population and community.

## CHAPTER II

### REVIEW OF LITERATURE

The purpose of this literature review is to (a) provide a background of information on remote rural areas and schools (b) introduction of factors that influence the operation of isolated rural school with limited resources (c) introduces relevant factors that impacts student' achievement (d) introduce the incorporation of technology for teaching and learning and (e) school accountability.

This chapter is organized into the following main sections: (a) an overview of rural areas and schools, including the characteristics (b) factors that influence the operation of remote rural schools, (c) factors that impact student achievement (d) instructional technology, and (e) school accountability. The first two sections present a discussion on rural schools in America, and their characteristics. The next two sections discuss factors that influence the operation of the school and factors that impact student achievement. Finally, the last section presented research on the incorporation of instructional technology and school accountability.

#### Rural Schools in America

There were approximately 99,000 public elementary and secondary schools, located in 14,000 school districts in the United States cities (National Center for Education Statistics (NCES), 2015. These schools served over 49 million students.

Furthermore, more than half of all operating regular school districts in the United States were located in rural areas (57 percent), while 20 percent of school districts were located in suburban areas, 18 percent in towns, and 5 percent in cities (National Center for Education Statistics [NCES], 2015). In addition, NCES (2015) reported that 10 million students attend rural schools, approximately 21% of all P-12 students in the U.S.A. Rural areas covered over 55% of public school districts and 31% percent of public schools. Rural areas differed, just as rural schools do. The word rural was defined by the characteristics of an area in a country, the way of life of the people of an area (U. S Census Bureau, 2010). For example, health care agencies and housing authorities may define rural differently. According to Reynnells and John (2015), the most prevalent definition used to define rural was created by three government agencies: the U.S. Census Bureau (CB), the Office of Management and Budget (OMB), and the Economic Research Service of the U.S. Department of Agriculture (ERS-USDA). The criteria for rural, included the geographical locality of the area, and the size of the school, and population. However, the U. S. Bureau of Census (2010) criteria further discriminated among rural schools, by taking into account the distance of the geographical location from a more populated area. Hence, areas twenty-five miles or more from a larger area were identified as being remote rural. Thus, a distinction made among rural schools characterized rural schools located in isolated areas. Redding and Walberg (2012) characterized rural by the “geographical location, low population density, family isolation, and community remoteness of an area,” (p. 5). In either case, the definition of

rural, technically define a rural school (Nelson, 2010). Even though rural schools were defined according to the definition of rural, rural schools varied. For the purpose of this study rural referred to a school located in remote areas, with a small population, twenty-five miles or more from, a suburban or urban with fewer than 600 students in a school.

### Remote Rural Schools

With the implement of educational standards geared toward increasing all students' achievement, by affording all students an equal education, rural schools became a priority ((Rios & Rose, 2008). Usually quantitative descriptions of rural provided an overall measure of the number of schools and students attending school located in rural areas. Although a numerical description of rural schools often provided a fair statistical measure, numbers missed the essential meaning of rural schools. In essence, rural was broken down into three categories, fringe, distant, and remote, with remote describing an area that is the most isolated. The U.S. Department of Education (2006) further defined rural schools as schools with an enrollment of six hundred students or less.

### Attributes of Remote Rural Areas

Kim, Heather, Rendon, Laura, Valadez, and James (2011) implied that the characteristics of the environment inspired the culture and lifestyle of the people who occupy the area. The geographical location of the area was a pivotal characteristic, which ultimately, defined remote rural schools.

Geographical Location

According to Nickerson and Borchers (2012) the geographical location of the areas determined how the land was use and structured, which in turns, depicted the condition of the area. Nevertheless, Wang, Heisey, Schimmelpfennig, and Ball (2015) pointed out how the land in remote rural areas was used for agricultural purposes, farming, and raising animals, such as cows, hogs, chickens, and crops. Brown and Stommes (2014) reported that fewer farms existed in remote rural areas; remote rural areas, often, were not developed and in some instances had no form of government. Decreases in the number of farms led to large amounts of land sparsely located throughout the area. The infrastructure of the area was poor, and no public forms of transportation existed.

Nickerson and Bucholtz (2015) reported the landscape shaped the physical characteristics of the land, which if favorable, was an important asset in remote rural areas and on the other hand, if unfavorable, presented obstacles to all aspects of the area. Rural areas were enhanced through the construction of facilities, roads, and transportation. However, undeveloped rural landscapes lacked the physical features to support the needs of the area. If the physical features of the area did not support the area, the area was not being productive. The physical features of remote rural areas were contingent upon the conditions of the geographical location of the area.

Physical features. Kimmel, Hull, Stephenson, Robertson and Cowgill (2011) characterize remote rural areas as one where a few local stores were sparsely located, lack adequate housing, old run -down buildings with at least one school to support the

community. In a similar fashion, Redding and Walberg (2014) mentioned remote rural areas did not have museums, theaters, zoos, public library, colleges, and access to technology or public transportation. Strange (2011) indicated that remote rural areas did not have adequate medical facilities, industry, and other resources, to support the needs of the people living and attending school in the area. Remote rural areas deprived of the ability to grow economically, presented challenges for the people who live in the area and the school system.

Economic growth. Duncan (2007) reported some rural areas had laws and programs designed to preserve agricultural land, farms, and ranches. These rules hindered economic growth and create barriers to attracting industry and providing the infrastructure for technology. Therefore, in the case of remote rural areas, government and local leaders in their effort to increase economic growth were not always successful. Howley (2002) also indicated how the locality and the physical features of the area impacted the ability of the area to attract industry create jobs, thereby, generate revenue. The inability of remote rural areas to develop and grow had a profound effect on the populations' culture and traditions as well as their aspirations in life. The characteristics of the geographical location and the population in terms of the demographics, along with their finances and resources was vital to understanding how the geographical location of remote rural areas influences education thus students learning (Luo, Robinson & Detwiler, 2012).

## Population

Fasko, S. and Fasko, D. (1999) indicated that the population of people in remote rural areas varied in term of the demographics, income, and resources. Consequently, in isolated rural areas without adequate resources to support the income, health, welfare, safety, and education of the people, variations were noted, in the demographics of the people living in the area, their income, and personal resources. The inability of the areas to support the needs of the people influenced the lifestyle, thinking, and behavior of the population's toward education and life in general.

Demographics of Population. The demographic profile of rural and small towns changed significantly. Kirschner, Berry and Glasgow (2006) indicated trends in age, gender, and ethnicity was constantly occurring throughout rural areas. Quite often, the members of the population, age, gender, and ethnicity influenced the growth and success of the area's economy. One reason, remote rural areas were experiencing changing trends in the demographics of the population, employment and education. For instance, some people moved to remote rural areas seeking employment; on the other hand, some moved away for the same reason. The demographics of the population were influence by the educational needs of the people. Often, remote rural areas did not have post-secondary institutions and people relocated seeking opportunities to further their education for personal growth.

*Age.* A study Lichter and Brown (2011) reported that trends in the age of the population, which indicated a decrease in the number of young adults in remote rural

areas. Ulrich, Schad, Henly and Safford (2013) pointed out that young adults left rural areas in search of employment, higher wages and a better education, whereas, older people, tended to move into rural areas. An increase in the older members of the population attributed to retirement, issues with health and life span (Glasgow & Berry, 2013). The ages of the population influenced the area's ability to generate revenue and additional funding. Consequently, the inability of remote rural areas to generate revenue through taxes or other initiatives, directly affected the operation of the schools and the opportunity to provide students with adequate educational resources.

*Gender.* Hoppe and Korb (2013) indicated that females outnumber males in terms of the gender make up of remote rural areas and in the school. Hertz, Kusmin, Marré and Parker (2014) reported that more women in rural areas were working, raising their children alone, and managing the household. With this being the case, the role, and responsibility of taking care of the family fell on women in remote rural areas. Cheadle, Amato, and King (2010) reported males were more likely to be unemployed, earn minimum wages, incarcerated, and suffer from addiction to alcohol and drugs, and poor health. These circumstances influenced the children of rural families, and their attitudes and values about education.

*Ethnicity.* One of the most notable changes in the demographics of the population in rural areas was the racial makeup. Brown (2014) suggested that as a whole, Caucasian and African American were the largest ethnic group in southern remote rural areas. In the same study, Brown stated that Hispanics and Asians were the fastest

growing minority groups in the United States, in particular in rural areas in the southern part of the country. However, in the context of education, The National Center for Educational Statistics [NCES], 2011) reported that African Americans made up the largest ethnic groups in remote rural and small towns in schools. Thus, schools located in remote rural areas in the south, were likely to serve more African American students than other rural and non-rural schools.

Population incomes. Incomes derived from ventures such as farming, forestry and agriculture were the usual incomes of people living in rural areas (Jagger, 2012). Researchers Vedeld and Sjaastad (2014) suggested factors related to the physical environment, government policy, and the law, which were beyond the control of the population; influences the incomes of the members of the population. Nevertheless, Jagger (2012) noted that income generated from forestry, farming and agricultural jobs may be relatively low due to a lack of demand in manufacturing and agricultural type industries. Consequently, if the area cannot generate employment, the people living in the area were often unemployed and had low or no income. Many members of the population in remote rural areas rely on income from agricultural ventures. Quite often, due to the decline in agricultural- type jobs, they were deprived of the necessities of life and struggle to maintain their households (Vedeld & Sjaastad, 2014).

Personal resources. Krieger, Williams, and Moss (1997) concluded that the income level of the people living in the area included ownership of land, cars, houses, and savings. Farrigan (2014) indicated that people lacking the necessary resources such

as food, clothing and housing, coupled with the inability to access basic services such as health, and education were living in poverty. Lyson (2002) revealed how people living in remote rural areas lack adequate housing, personal transportation, health or other insurances and saving accounts. Thus, many of the residents in remote rural areas were unable to afford necessities, let alone luxuries. Under these circumstances, personal resources were few, and, people cannot afford luxuries or supplies and materials needed for school as well as other needs.

### Communities

Ulrich (2011) describes a community, as a group of members of the population, residing in a specific locality of an area. Usually, members of the population residing in the same area were affiliate by age, ethnicity, language, organization, income level, or religion. For example, residents in remote rural areas residing in communities, where members earn sufficient incomes, have higher educational levels (Hull, 2003).

Regardless of how residents of communities are affiliated, communities differed from each other. These differences were in the educational attainment level of members of the community, the financial status of the community and the availability of community resources. The variations in these aspects of the community influenced the ability of the area to support the school.

*Educational attainment level.* Camp and Waldorf (2014) posited that the individual's educational accomplishments played an important role in the community's ability to support the needs of the people. Camp and Waldorf also indicated that

increased education levels were typically associated with job opportunities and higher pay. Thereby, suggesting that productivity and economic growth in communities centered on whether or not its population was highly educated. According to Kusmin (2014) the overall the educational level of the residents of rural communities, was one indication that the residents, especially in remote rural areas, at a minimum completed high school, but not many attended or completed college. Rural communities, with residents having low levels of education created barriers for personal growth and the economic growth of the community, all of which affects the operation of the school.

*Community socioeconomic status.* Another characteristic of rural communities, which makes them differ, was the socioeconomic status of the community. According to Green (2014), the major employers in rural areas were manufacturing and agricultural industries. However, a decline in farming in rural areas and trends indicated a higher rate of unemployment among rural residents (Read, 2013). Farming and manufacturing jobs did not generate enough income for the residents to obtain personal resources such as cars, other personal assets, or save money (Read, 2013). The residents of rural communities, as a whole, have low or no income, thereby, making it difficult to obtain personal assets. Johnson, Strange, and Madden (2010) mentioned the economy of remote rural communities were characterized by poverty, younger residents settling for low paying jobs, and fewer family farms. Most often, the income of the residents of the community was inadequate, or below state poverty guidelines. Ultimately, this affected

the ability of the area to generate revenue for community resources to support the residents and the educational opportunities of the students attending school.

*Community resources.* With regard to community resources, Anarde (2015) described the inability of remote rural areas to generate enough funds for community services and activities impinged on the opportunities and experiences of the residents. Khattri, Riley, Kane and Pelavin (1997) indicated that rural communities needed access to health care, education and recreation resources to support the needs of the community, families and the school. Although community resources were essential, in remote rural areas experiencing declining populations, fewer jobs, lower incomes, and community resources may not exist. Residents often sought financial assistance from local, state, and federal agencies or community organizations. Accesses to community resources, especially, health care resources, were vital to the mental and physical well-being of the families in the community. School often relied on the community to support the health care needs of the students attending schools. Consequently, students living and attending school in remote rural areas often, lacked access to proper health care, and access to health care, such as vision, hearing, and other medical conditions that directly affected their abilities to learn.

*Health care.* According to the Simmons, Casas, Morgan and Feldman (2012) rural communities often did not have access to health care resources and had fewer doctors. In addition, members of the community did not have the transportation or money to travel to other places for medical attention. Furthermore, Ranson, Chopra,

Atkins, Dal Poz and Bennet (2010) reported that rural communities had a higher incidence of disease and deaths, coupled with the fact that the life expectancy of rural residents was lower than residents of urban areas. In many instances, family members and other members of the community were burdened, with the responsibility of taking care of those who became physically or mentally ill. In some cases, (Bain, Rueda, Villarreal & Mundy, 2014) older children were responsibility of taking care of their sibling or parents who were ill. Ultimately, this led to poor school attendance and the loss of the opportunity to learn, which in turns caused the student to fall behind in school and possibly fail. Furthermore, the student might not be able to access educational resources outside of the school to support or continue their education.

*Educational resources.* Educational resources allowed the school and families with children who were unable to attend school, to have additional help and opportunities for learning to continue. Equally important was the ability of the community to provide access to educational resources such as technology, activities, events, and materials. However, Kidron and Lindsay (2014) when surveying the availability of resources in rural communities pointed out that, remote rural communities lacked access to zoos, museums, libraries, and other educational resources. Muilenburg and Berge (2005) mentioned how rural areas did not have the infrastructure for technology, which in turns, deprived members of the community opportunities for using computers to access the internet. This influenced the professional and personal growth of the residents, learning experiences for students and the economic growth of the community. In the same way,

remote rural communities need educational resources; members of the community need access to recreational resources as well. Often, remote rural areas did not sponsor recreational activities such as sports, or other activities for families to attend.

*Recreational resources.* The importance of having access to recreational resources, relevant, literature was somewhat inconsistent regarding its' impact on the student's behavior (Lopez & Caspe, 2014). Durlak and Weissbreg (2011) suggested that programs outside of the school sometimes had a positive effect on students' behavior, as well as, personal, and social development of families. However, Lopez and Caspe (2014) reported that no statistical data existed showing that recreational programs significantly affected the student's behavior or success in school. Nevertheless, recreational resources could be beneficial to remote rural communities, and their families. Unfortunately, in remote rural areas, families and communities could not afford the opportunity to engage in recreational activities outside of the school.

#### Factors Influencing the Operation of Remote Rural High Schools

Administrators of rural school faced challenges, principally due to the unique characteristics of the area where the school was located. Consequently, of the unique characteristics of isolated or remote rural areas, Abshier, Harris, and Hopson (2011) and Yettick, Baker, Wickersham and Hupfeld (2014) reported operational problems with funding, recruiting, and retaining teachers, community, and parental involvement, motivation, and technology were likely to occur. On the positive side, Barley and Beesley (2007) reported some rural schools effectively met those challenges, however,

with many struggles, especially, for schools located in isolated rural areas. The challenges encountered by administrators of remote rural schools had a bearing on the operation of the school, ultimately, impacting students' achievement. One operational challenge that indirectly linked other issues encountered by remote rural schools was funding. Funding was somewhat a catalysis that spearheaded other challenges, simply due to the lack of revenue needed to implement and obtain educational and other materials or supplies to support and manage the school. This made funding one of the most important challenges encountered in school systems, especially, when remote rural school districts were not able to generate a sufficient amount of revenue to operate the schools in their districts.

### Funding

According to Vaughn and Saul (2013), administrators of rural schools often sought support for the challenges they faced. Rural school districts with small populations and limited revenue, often, experienced budget restraints. Even though, rural areas benefited from formulas that adjusted aid based on district enrollment size, the amount of assistance was usually small. For instance, rural school districts could apply for grants to help with funding; however, the amount was usually based on the number of students attending school, which often limited the award (Johnson & Strange, 2007). Levin, Manship, Chambers, and Johnson (2011) reported that on the average, remote rural schools usually received fewer funds per pupil than non-rural schools, yet and still, it cost more to operate rural schools. Nonetheless, other funding formulas compensate for

schools with small enrollment. For instance, most states made funding formula adjustments for at risk students such as English Language Learners (ELLs), and Special Education students with disabilities (SWD). With remote rural school districts underfunded, and facing federal and state cutbacks in funding, the burden of funding meant schools relies on local school systems. With declining populations, and fewer funds, rural school districts were forced to make cuts to their budgets. Unfortunately, these budget cuts affected all aspects of the school, thereby, complicating the efforts to operate the schools. Ultimately, this affected the recruitment and retention of teachers.

### Recruitment and Retention of Teachers

According to Kelly and Fogarty (2014) teacher recruitment were a chief concern for rural school administrators. The quality and effectiveness of the teachers were essential as teachers recruited to teach. Clotfeller, Ladd, Vigdor, and Diaz (2003) explained how recruiting and retaining teachers certified to teach in low performing rural school were difficult due to school accountability measures. Berry (2013) emphasized the importance of recruiting and retaining teachers that were highly qualified and effective, was essential in low performing schools for improving student achievement. Although, administrators of remote rural schools realize the importance of finding teachers that are qualified and effective, just as important was the teachers' background, personal characteristics, or educational experiences that prepared them for life in rural areas (Johnson, Showalter, Klein & Lester, 2014). Monk (2007) pointed out that although rural schools had small classes, and not as many discipline problems, teacher

retention rates were low and retaining teachers was difficult. In addition, Johnson et al. reported a high percentage of job vacancies in rural schools and a high demand for certified teachers to teach specific course content, a problem in remote rural areas that were isolated with limited community resources and inadequate housing. Hammer, Hughes, McClure, Reeves and Salgado (2005) indicated administrators of remote rural schools, not only find it difficult recruiting teachers trained in specific areas to work in rural areas but retaining them as well. Maranto and Shuls (2012) reported that due to restraints on their budget, administrators of rural schools could not afford to offer new or experienced teachers adequate incentives and bonuses like urban schools. Furthermore, Burton, Brown and Johnson (2013) pointed out that rural school teachers felt professionally isolated, often lacking teaching credentials, and resisting change. This presented a challenge for rural school administrators trying to meet federal mandates, increase students' participation in state educational initiatives as well as, offering the students attending their school a good education. Therefore, communicating with members of the community and parents about recruitment and retention was important to parents and community participation and support in all aspects of the operation of the school.

### Parental and Community Involvement

It was not clear, whether rural communities or parents were any more or less likely than non-rural communities to be involved in education (Howley, 2007). Herrold and O'Donnell (2008) found that parent involvement was higher in rural than in non-rural

communities. In contrast, findings Noel, Stark and Redford (2015) in a large national survey of kindergarten through grade 12 students suggested that parental involvement tended to be higher in non-rural communities than in rural communities. Maynard and Howley (2007) posited that even if parent involvement was more prevalent in rural schools than in urban and suburban, rural administrators face differing issues in their efforts to involve parents and communities.

*Parental involvement.* Jeynes (2012) and Rafiq Fatima, Sohail, Saleem and Khan's (2013) findings provided data that parental involvement in education played an important role in the students' success in school. Henderson and Mapp (2002) concluded that when schools, families, and community groups worked together to support learning children, did better in school, stayed in school longer, and liked school more. Hence, the parents in remote rural areas understood the importance of learning and achieving, and placed value on education, but often lack the resources to get involved in their child's education (Semeke & Sheridan, 2012).

*Community involvement.* The ability of the community to support the school could have a positive effect on student achievement (Weiss, Lopez & Rosenberg, 2010). However, rural schools, located in isolated areas, often, lacked the funding to support the school or resources to sponsor events to build parental involvement (Weiss, Lopez & Rosenberg, 2010). Ultimately, fewer resources led to fewer activities in the community, which in turn provided fewer opportunities for parents and other members of the community to become involved (Redding, Langdon, Meyer & Sheley, 2004). Moreover,

Epstein (2010) indicated in remote rural areas that parents attended after school events more than parents in non-rural areas do. For the most part, parents relied on the school, and rural schools were often the largest employer in the community. Members of the community, often, used rural schools facilities for functions other than education. In addition, parents believed that the school provided a safe place for their children to be when they were not home (Kaladifko, 2013). Therefore, supporting the needs of the community and parents in isolated rural areas was beneficial to the success of the school.

### Motivation of Students

Rural school students as well as non-rural school students expressed boredom and disinterest in school in general. Arslan (2013) suggested that bright students needed help when it came to being motivated to learn. Often students living in remote rural areas did not have the desire or showed an interest in learning; this presented a challenge for administrators of rural schools. Hardré and Hennessey (2010) reported that factors such as lack of jobs, poverty, school, and family isolation, lack of experiences, lack of educated and successful role models in the community, and lack of family support for education contributed to student motivation. In a similar way, Lim and Kim (2003) pointed out how an individual attitude was influenced by factors such as culture and traditions, opinions of friends, co-workers, supervisors, family situations, mental health, attitude toward acquiring knowledge and skills, and attitude toward change. The American Psychological Association (2012) suggested that a student's awareness of family economic strain and personal financial constraints, sometimes, elicited emotional

anguish and depression in students and influenced their success in school. Therefore, when it came to improving students' attending rural schools in low socioeconomic areas, the impact of students' feelings and attitudes about their family finances was a key factor as to whether a student's performance improved.

Hardré, Sullivan, and Crowson (2009) suggested for learning to occur students' needed to be interested and desire to learn, but to do so, they needed to believe they could learn and realize the value of their learning. Therefore, once the student saw the value of learning, they became motivated to learn. Motivating students in remote rural schools were essential to the students' success in life, college, and careers. Therefore, administrators and policy makers needed to promote the value of how a good education, and how the students' efforts in school led to positive results. Equally important, was implementing techniques and strategies that stimulated curiosity and interest in learning. One strategy believed to motivate students was technology (Means, 2010). The use of technology, regardless of the purpose, tended to draw the attention of students and sparked an interest in how technology works and what technology did when utilized correctly. Innovations in technology in education had the potential to promote learning in remote rural schools and motivate students to experience learning in a new way.

### Technological Resources

According to Sutton (2013), technology was an integral part of the life of Americans; in fact, members of society used some form of technology on a daily basis. For instance, smart phones, iPad, iPod, tablets, computers, and e-readers were used daily

for business or personal needs. Furthermore, innovations in technology gained momentum, and increased the need for the infrastructure of broadband connectivity. However, there were challenges that affect broadband connectivity in remote rural districts (Howley, Kim, & Kane, 2012).

Bakia, Means, Gallagher, Chen and Jones (2009) emphasized that sheer access to technology was not enough to influence student achievement, rather, technology had to be used in ways that support students by providing opportunities and resources that allowed them to experience learning in a variety of ways. According to Bakia et al., utilizing technology for learning that took place over the Internet, whether partially or fully was online learning. However, there were various approaches to online learning, for example distance learning, computer based instruction, e-learning, computer assisted instruction, and web-based instruction. The approach to instruction was what distinguishes them from each other: computer-based activities; software for teachers; computer-based lesson plans and assignments. Halverson and Smith (2010) reported that technology had the potential to change the way students learned, schools' delivery of instruction and the way individuals communicated with others. However, Genachowski (2013) reported that policymakers recognized that the availability and use of high-speed Internet services were essential to economic growth as well as student achievement. Nevertheless, a high percentage of remote rural schools currently operated with inadequate connection to the internet (Genachowski, 2013).

Inadequate connection in remote rural areas was attributed to the lack of or poor high-speed transmission technologies such as, Digital Subscriber Line (DSL), Cable Modem, Fiber, Wireless, Satellite, and Broadband over Powerlines (BPL). The broadband technology used, often, depended on whether the area was urban or rural. Having access to fast broadband was important for individuals, businesses, and schools. However, in remote rural areas, the connection was slow (Genachowski, 2013). Without adequate broadband width, teachers and students had trouble with slow internet speeds and could not always access online videos, and other resources. Therefore, was essential for administrators of rural schools and the community to work together to ensure the infrastructure for technology existed (Halverson & Smith, 2010). By doing so, families were afforded the opportunities to experience using technology for personal, business and educational needs. Nevertheless, Blankenship and Atkinson (2010) agreed that technology had the potential to improve student achievement, but stressed the importance of being adequately prepared for learning using technology. Gordon (2011) indicated that often, families in rural areas did not have access to the internet or computers, therefore, their children might not have much experience with using technology to access information.

Accessibility of the technology. According to a Federal Communication, one problem common to remote rural areas with small population was the inability of students and their families to access the internet. Beede and Neville (2013) reported that rural homes across the country had no Internet access, compared to urban households.

Accordingly, United States Department of Commerce [USDC], (2013) reported that not having access to computers deprived families of the opportunities made available with technology. However, administrators of remote rural schools often encountered families and students who did not have access to technology or the internet in their homes. For instance, in order to gain access to the internet, the family needed services from a cable company, as well as, the computer and software. This was very expensive and many families in remote rural communities might not even see the need to spend the money, or even have the money to invest in a computer or the internet (Barnes & Coatney, 2015).

Remote rural communities and remote rural high schools were at risk when it came to using technology for conducting research, networking with others, and applying for colleges and jobs. However, students having access to technology for learning did not always benefit from that access (Best & Dunlap, 2012). Nevertheless, understanding the value of technology and the role the internet played in educating the students had a valuable role in promoting student achievement as well as the economic growth of the community.

*Design of the technology.* Although having access to technology was important, the way the technology was set up was also significant. Sutton (2013) reported that a person's willingness to use technology, often, depended on the design of the technology. In other words, if the technology was easy to operate, dependable, and accessible, the more likely a person embraced using technology. In addition, Holden and Rada (2011) posited that when using technology in schools, making sure students did not encounter

problems or malfunctions was important. When students experienced problems using technology, often, students lost trust or confidence in using technology, and in particular remote rural school students with inadequate access to technology faced problems with access to technology.

In remote rural areas, often, there were misconceptions or concerns surrounding what can happen when the internet was used. For example, some rural people thought technology allowed others access to their home or personal information. In remote rural areas, this misinformation came from parents and others who were uncomfortable or afraid of using technology. Consequently, Hassel and Dean (2015) reported that children and teenagers spent the majority of time with parents who were not comfortable or did not trust technology. Remote rural school students whose families held these beliefs were automatically at a disadvantage when it came to using technology to learn. Therefore, children were not afforded, opportunities to explore technology or use computers for different purposes to get online.

Often, rural school students with limited experience with technology did not know how to operate or navigate the technology (Cradler, McNabb, Freeman, & Burchett, 2002). Therefore, using technology that was convenient to use aided students in locating, information, and resources (Chen, Fan, & Macredie, 2006). Therefore, the design of the technology needed to support students' who had limited skills with using technology.

## Factors Affecting Student Achievement in Remote Rural High Schools

One factor believed to have a vital influence on student achievement, in particular, remote rural high schools was the use of technology for teaching and learning. In remote rural high schools, the characteristics of the environment, population, and community influenced the student attitude and behavior toward learning (Flicker, Kristapovich, Rathbun, Wang & Zhang, 2013). The influence was evident when observing, the physical characteristics of the school population, social-cognitive abilities of the students, students' preference for course selection and the method used to deliver instruction (Lim, Kim, Chen & Ryder, 2008). When administrators understood how the characteristics of the population, ability and learning preferences influenced the students' behavior toward learning, employing technology in isolated rural high schools presents solutions to raising student achievement. Familiarization with what research had to say about students' performance allowed administrators to compensate for the differences that existed among the students, to plan and make the adjustments needed to manage the school and foster student achievement.

### Students' Physical Attributes

Just as differences exist between rural schools due to their geographical location, differences between the physical characteristics of the student population included age, gender, and ethnicity as well (Song & Oh, 2011). Sometimes, these differences

influenced students' overall performance (Chyung, 2007). This might be true in remote rural schools, where students might not be confident or familiar with using technology for learning.

*Age of the student.* Research on how age influences learning has reported mixed findings, however, Chyung (2007) pointed out that the maturity level of student influenced the students' performance with technology. Chyung (2007) believed that older students were more successful when using technology for learning, simply because they were familiar with computers, the software that supported the course or experienced with coursework online. In contradiction, Cassidy (2012) found that younger students perform better than older students did. However, there were contradictory findings related to courses of study in science, engineering, and technology related subject areas. Some studies (Fredericksen, Pickett, Shea, Pelz, & Swan, (2000); Lim & Morris (2009) found age to be a substantial predictor of students' performance when using technology for learning, others studies such as Martínez-Caro (2011) and Yukselturk and Bulut (2007) reported no substantial relationship between age and performance. In terms of student satisfaction with using technology for learning, most empirical evidence (Arbaugh, 2001) suggested age had no real effect on how students felt about learning using this method of instruction.

*Gender of the student.* McSporran and Young (2001) reported that research on females assumed that females were at a disadvantage when it came to learning, in particular with instructional technological devices. On the other hand, González-

Gómez et al. (2012) contradicted those findings showing female students tended to enjoy using technology for learning more than males. Even though Sheared (2009) reported that gender was important when considering academic achievement, Chen and Tsai (2007) indicated that gender was more or less a concern in relation to the student's attitude, interest, and ability to use the computer, afford computers, or access the internet. In the same study, Chen and Tsai found that female students were less likely than males to take advantage of the opportunity to use a computer for learning, based on their interest, experiences, and attitudes. Their study suggested that female students knew less about technology did not enjoy using the computer as much and had more problems with the software. Chen and Tsai (2007) believed the use of the Internet for learning was more related to socioeconomic factors rather than gender because in rural areas, females often did not have computers at home or connection to the Internet; males and females used the Internet equally but in different ways. For examples, females in high school used the Internet more to email and males use the Internet more to search for information and entertainment. In contrast, Ono and Zavodny (2003) indicated very few differences in the male and female students' attitudes toward using technology for learning and both spent about the same amount of time on the Internet. However, Lim and Morris (2009) and Martínez-Caro (2011), concluded that gender had no substantial impact on students' performance and did not predict success when using technology for learning.

*Ethnicity of the student.* In reference to the influence of ethnicity on student achievement, various studies have reported that racial makeup of the students influenced

their performance. Lui and Cavanaugh (2011) reported that in general Asian and Caucasian students outperformed Hispanic and African American students; however, when using technology for learning there was not a significant difference in their academic performance. However, Ashong and Commander (2012) reported that differences existed between Latino students' attitudes about using the internet to take a class. For instance, Latina/Latino students agreed with using technology for learning as an option to traditional courses, but preferred traditional classroom instruction with a teacher when taking a course. In similar fashion, Okwumabua, Walker, Hu and Watson (2010) pointed out that African-American students did not like using technology for learning and preferred using the traditional classroom approach with a teacher. Some ethnic groups, attitudes toward learning with technology varied; depending on the issues, they faced at home and in their environment. Even though, age, gender and ethnicity influenced student's performance; more important was the students' ability to cooperate, reason, think about learning, and know what way was the best way for them to learn.

### Students' Social-cognitive Abilities

Greene and Azevedo (2010) suggested students living and attending school in remote rural areas often, had the ability to learn, but not the desire to learn. In other words, the unique characteristics of their environment influenced the personal and social aspects of their life, which in turns affected their desire and ability to learn, get along with others and their aspiration for learning. Nevertheless, regardless of what method

used to deliver instruction, Woolfolk (2014) posited for learning to take place a student needed the desire and ability to learn and know how to communicate with others.

Social skills. In essence, the ability to reason and get along with others was essential for success in school, life, college, and careers. Witte and Sheridan (2011) contended that students attending school in remote rural areas, perhaps, due to socioeconomic factors, tended to lack the desire to participate in learning, had poor attendance, cause disruptions, and did not come to school prepared to learn. Furthermore, Witte, Coutts, Holmes and Sheridan (2012) indicated that students living in small rural communities where the poverty rate was high, with no jobs, and no skills, often, had inadequate social skills. The American Psychological Association [APA], (2012) noted that students attending remote rural schools, often, had not developed the interpersonal skills to listen to others, share, take turns and get along. Roseshine (2012) suggested students needed to interact with others, which in turns, forced them to adjust their thinking to accommodate the point of view others, to defend their ideas and examine their opinions. In a similar fashion, Bandura and Locke (2003) believed that when students saw others similar to them succeed, the situation reinforced the belief that they could be successful as well.

The classroom teacher could reinforce the student's social and cognitive skills by observing them working, and evaluating themselves; however, with technology for learning and no teacher, it was virtually impossible. Using technology for learning might not be as effective at helping students to develop skills like cooperation, teamwork, or

reinforcing motivation, or providing personal feedback. Liang and Creasy (2014) pointed out using technology for teaching and learning provided various ways to communicate with the students such as texts, pictures, videos and audio; however, the technology did not respond to students' comments, body language, and facial expressions. As previously, mentioned students living in remote rural areas, perhaps due to social cultural issues needed the emotional support of a teacher because they lacked the support at home, words of encouragement and assurance that the work they were doing will be worthy. Moreover, Jeynes (2010) mentioned that more than likely, a teacher increased a students' perception of themselves through inspiration. McMillan (2012) posited that the attainment of social skills could promote reasoning skills, and problem solving skills, all of which were important for students to be successful and compete in a constantly changing economy.

Meta cognitive skills. A students' ability to think about how they proceeded to complete assignments, projects and other tasks, and to evaluate their performance or product, was meta-cognition (Woolfolk, 2014). The ability to think about how and what to learn, played an important role in the students' performance. In other words, students who had a clear vision of what they want to accomplish and set goals to do so were more likely to be successful at learning (Shen & Liu, 2011). This was important when students were participating in instruction delivered by technology; when students work on their own, they had to decide how much time to spend on the assignment, determine what they needed to complete a task, think of ways to complete the task and examine and judge

their responses. In addition, Puzziferro (2008) found that students that were high achievers were likely to use their meta-cognitive skills and be more satisfied with learning whether it was using technology or traditional approaches to learning. With this being the case, students' that were satisfied with learning, usually were motivated within themselves to learn.

Often students living and attending school in remote rural areas lacked the motivation to complete courses taught using technology for learning. This might partly due to social and emotional issues derived from families facing unemployment and low incomes. Students attending remote rural high school might have the emotional support, encouragement, and assistance with learning from home. These students may not have learned to manage their time, plan for assignments, might have difficulty learning with a teacher, and let alone on a computer without a teacher. Woolfolk (2014) explained that students who managed their learning and initiated the process of learning without being told are self-starters, and tended to be higher achievers in school, regardless of what method was used to deliver instruction.

Self-regulated learning. One thing that influenced a student's success in school, according to Zumbrunn, Tadlock and Roberts (2011) was the process students engaged in, which enabled them to manage their thoughts, and behaviors so that they controlled their learning. Jarvela and Jarvnoja (2011) believed the ability of a student to start a task or assignment, own their own, was an important part of learning, which in turn resulted in students' achievement. However, Lee, Choi and Kim (2013) found that when using

technology for learning, the students' inability to initiate learning on their own was a key factor as to whether or not students completed or discontinued using technology for learning. Cho and Shen (2013) also pointed out that personal issues might interfere with a student's ability to control their learning. Sweeney (2015) reported that a student's perception of their family financial condition could affect their emotions and influence their academic performance; therefore, students living in rural areas with low-income families were likely to have problems related to learning. Students may discontinue courses because they had not developed the skills needed to learn on their own. In addition, Rakes and Dunn (2010) indicated that students who knew how to eliminate distractions, when and where to study, and how to avoid procrastination, did well. In the same way, King, Harner and Brown (2000) indicated that students in control of their learning were more likely to perform better when using technology for learning. Morris, Finnegan and Wu (2005) showed that the students' level of satisfaction when using technology for learning were closely related to their ability to control their learning, their preference for course selection and how they wanted the course to be taught. This in turn influenced the students' attendance and school performance in the course.

### Students' Preference for Course and Delivery Method

One of the main purposes of incorporating technology for teaching and learning in remote rural schools, was the ability to select and deliver instruction in courses, that otherwise might not be possible without technology. However, rural school administrators needed to consider what courses to deliver by instructional technology.

One reason was the students' preference for courses and method of delivery that influenced their perception of learning and course satisfaction (Harrell & Bower, 2011). With this being the case, administrators of remote rural schools were faced with the question of whether to use technology in some courses and not in others and to what extent. Students in remote rural schools might not have acquired the skills needed to learn some content on their own, especially those that were difficult and challenging. In remote rural high school, the need to be successful was imperative because students were required to pass but might have difficulty with subject content.

Preferences for Courses. One of the advantages of using technology for learning was the ability to expand course offerings. However, Hart (2012) pointed out that students' preference for courses impacted students' perceptions of their learning and course satisfaction. Therefore, with the availability of the Internet, and access to numerous courses, administrators of rural schools had to decide what courses to deliver. Students living and attending school in remote rural areas might not have acquired the skills needed to learn the content without a classroom teacher. However, administrators' of remote rural schools did not have many options when it came to some subject areas, depending on the availability of teachers. Smith, Heindel and Torres-Ayala (2008) found that certain disciplines were not suited for learning online. Carnevale (2003) identified courses such as lab sciences and health care, as not being conducive to learning using technology without a classroom teacher. In addition, Smith et al., (2008) identified mathematics courses as disciplines that were not suited for learning using technologies

for instruction without a classroom teacher. Smith et al., also found that student's preference for other courses were higher than for math and science courses. This placed remote rural school administrators at a disadvantage, since, science and math were the areas where there is a high demand for teachers. Olson and Wisher (2002) explained that science and math are required for students' to graduate from school. Terry (2001) suggested that courses such as accounting, economics, computer information systems, marketing, and management have potentially been more conducive to learning using instructional technologies. With this being, the case, using a method of instruction, other than the traditional methods to teach some courses, especially math and science, led too much apprehension for both students and school administrators.

Preference for course delivery. Research on course delivery and its' influence on course completion and performance was inconsistent. However, Russel (2001) examined the differences in student success when a course was delivered on a computer based program and a traditional classroom approach. The research revealed no statistically significant difference in student success based on the method of delivery. In contrast, Shachar and Neumann (2010) found that course completion was generally lower in courses delivered on a computer when compared to a traditional classroom course. In addition, Atchley, Winenbach and Akers (2013) found statistically significant differences existed in both course completion and academic performance for students enrolled in courses delivered using technology for instruction versus the traditional classroom method of delivery of courses. Therefore, when incorporating technology to deliver

course content, it was important to consider the student's preference about how they wanted to learn, that is to say, by the computer or by a classroom teacher. Consequently, if they were not satisfied with the instructional method, they might not want to participate, and might not be motivated to learn, especially in remote rural schools, whereas, students most often, depended on the teacher to instruct them.

### Opportunities for Learning in Remote Rural High Schools

Educational policymakers at all levels worried that students attending school in remote rural areas were not afforded the same opportunities to learn and be successful, as, students attending school in non-rural areas. In order to assure that students attending public school in remote rural areas had the same experiences in learning, policymakers implemented policies and guidelines that governed all public schools. In addition, to make sure schools abide by these policies and guidelines, a system was used to monitor compliance, thereby, applying sanctions for schools not in compliance (No Child Left Behind, 2001). Although policies and guidelines aimed to promote educational opportunities for student in remote rural schools, doing so presented a challenge for administrators. Administrators of remote rural schools, sought solutions to alleviate or diminish factors that influenced the operation of the school while simultaneously, improving students' achievement.

Innovations in technology have tremendously influenced education in many ways: learning, teaching, networking, data storage, resources, and communication. One of the

most profound influences on education was the use of technology for teaching and learning. Mean (2010) emphasized how the capabilities of digital media, coupled with easier access to the internet and the reduction in the cost of computers increased the use of technology in the school. Nagel (2010) discussed the growth and potential of using technology in K-12 schools and noted an increase in the public's approval of high school students earning credits in courses delivered using technology for instruction. This was particularly true in remote rural areas, where, it was difficult to attract teachers, qualified to teach AP courses.

Hassel and Dean (2015) emphasized that using technology for teaching and learning had gained much popularity, especially in remote rural schools. One reason being, technology allowed remote rural high schools to offer students opportunities for learning, that otherwise might not be possible. However, Hannum, Irvin, Banks and Farmer (2009) suggested that although technology was used in K-12 schools, the extent to which technology was used for teaching and learning in high schools for students earning credits, and the extent to which technology for teaching and learning was used in remote rural schools, had not been thoroughly investigated. Patrick and Powell (2009) pointed out that most studies mentioned the potential benefit of using technology for teaching and learning in small rural schools but did not take into account the geographic location of the students and suggested a need for more studies in secondary education focusing on isolated rural schools. However, Cavanaugh, Barbour and Clark (2009)

pointed out that using technology for teaching and learning had become prevalent in remote rural areas with limited resources.

### Instructional Technology

Instructional technology was the application of computer-based learning, multimedia materials, networks and communications systems to support teaching, learning, and assessment in school (Earle, 2002). Mathew and Poirier (2000) indicated that the World Wide Web (www) was a depository of instructional information and using technological tools was the means of distribution of the content for the enhancement of teaching, learning, and assessment. Usually, the instructional technology for teaching and learning were designed in the same way as traditional instruction by creating lesson plans with objectives, instructional strategies, materials, and assessment methods. The instructional strategies consisted of oral and written lessons, labs, and projects. The instructional materials included; text, sound, video, animations, chat rooms, discussion boards, and links to additional resources. In addition, the method of assessment included; essays, short answers, and multiple-choice questions and performance based assessments. Hence, instructional technology had the capability of providing immediate feedback on students' performance, thereby, eliminating the need to wait for results of test, quiz, and final exams.

*Why use instructional technology?* Johnson and Strange (2007) indicated that remote rural schools, often, encountered challenges due to the unique characteristics of the geographical area, which often did not favor education. These characteristics

indirectly influenced the operation of the school, thereby creating obstacles for administrators of remote rural schools in their effort to provide a good quality education. Therefore, in search of a solution to challenges with funding, recruitment, and retention of teachers, parent and community involvement, motivation and technology, often, rural school administrators sought ways that were not as costly, efficient, and effective. In light of this, Abrami, Bernard, Bures, Borokhovski and Tamim (2011) posited that some evidence supported the incorporation of technology for instruction as a way to address some of the challenges facing rural school administrator, suggesting, depending on how technology was utilized, it had the potential to alleviate or diminish most challenges. For the most part, Meyer (2008) and Twiggs (2001) suggested that the technology had potential to be cost efficient, since, the cost of computers had declined and allowed students the opportunity to experience learning by taking advantage of the many courses and resources made available. More importantly, incorporating technology in remote rural high schools for instruction prepared students to compete in a global economy, by keeping pace with innovations in technology and the opportunity to experience success in life as well as school, college and careers.

Regardless of the reason for incorporating technology for instruction, preparing students attending schools located in remote rural areas for new alternatives to learning was perplexing. Although using technology for instruction to promote achievement in remote rural schools was promising, Cavanaugh (2001) suggested that the delivery methods did not play a significant role in improving student achievement, instead; the

methods of instruction and individual differences among students were more than likely to affect achievement. Lack (2013) reported that using technology for instruction consisted of various approaches with the distinction made based on whether the technology used for instruction was delivered by a teacher, without a teacher, or a mixture of both. With this in mind, the method used when incorporating technology for teaching and learning was vital to student achievement. Therefore, when it came to promoting the achievement of isolated rural school students, especially at the secondary level, knowing what delivery method best suited the needs of the student was important to their success in school, as well as the success of the school.

*Instructional technology delivery methods.* Remote rural school administrators wanted to incorporate technology in a way that promoted the operation of the school and student achievement. However, administrators of remote rural high schools, facing budget cuts, low revenues and less funding, needed to consider the cost effectiveness of applying instructional technologies for teaching, learning and assessment. With the decline in student and people population, decreased in state and federal funds, limited schools and community resources, cost effectiveness often took precedence over the instructional methods (Bates, 2011). Nevertheless, one popular aspect of instructional technology was the option that allowed teaching and learning in a variety of ways. The incorporation of instructional technology in school allowed the use of asynchronous, synchronous or hybrid, a combination of several methods (Thrasher, Coleman, & Atkinson, 2012). However, in remote rural schools, the option utilized, often, eliminated

the need for a teacher due to budget restraints. Although, administrators realized this might not be the best approach, often they had no other choice. Nonetheless, Means, Toyama, Murphy, Bakia and Jones (2010) cautioned that using technology for instruction in school to replace traditional classroom instruction should be used when it was the only option available. Given that, instructional technologies might be incorporate in a way that allowed the delivery of instruction to take place using three distinct approaches.

*Asynchronous online learning.* In the case of asynchronous learning, students could be responsible for learning on their own, without a teacher. In other words, students worked at their own pace online, to complete coursework within defined time limits, such as a semester or year. As a part of the instructional process, students' performed tasks such as course lessons, labs, projects, quizzes and test. In addition, all course materials were online and links to other sites were available for use at home or anywhere the program was opened (Giesbers, Rienties, Tempelaar & Gijssels, 2013). Higley (2013) reported that students' had the flexibility to learn at their own pace, and place, without the constraints of a schedule, work at their own level, move quickly or slowly through the course materials, and review difficult materials as often as needed. More importantly, using instructional technologies without a classroom teacher, allowed students to explore resources that might be unavailable in the traditional classroom setting.

*Synchronous online learning.* Hrastinski (2008) described synchronous learning as learning online with the assistance of a teacher. Students worked with a teacher and

other students. According to Topeu and Ubnz (2008) in synchronous learning, students and teachers worked together, in the same place and at the same time. Usually, synchronous instruction consisted of the teacher facilitating the course, through class lessons, lectures, projects, and class discussions. Researchers Woo and Reeves (2008) and Dixson (2015) pointed out interactivity was the key to synchronous instruction, regardless of the instructional technologies applied. The interactions in the synchronous approach to instruction allowed students to demonstrate their knowledge, practice their communication skills, discussions, problem solving, and group projects. Most important, the study mentioned how students built relationships with their teacher and classmates. With this in mind, the idea that teachers built one-on-one relationships with students was important in remote rural schools where students and families, might have social emotional issues and needed the support of a teacher. However, Mean et al., (2013) reported that using the synchronous method was better than the asynchronous methods, in grades K-12, simply because students often needed the structure provided by a classroom teacher and human interaction for support in order to learn.

*Hybrid or blended online learning.* Using a combination of both synchronous and asynchronous approaches was hybrid or blended online learning. Employing both synchronous and asynchronous approaches to teaching and learning improved the student-teacher interactions, fostered student engagement, and improved achievement. Hastie, Hung, Chen and Kinsuk (2010); Simonson, Smaldino, Albright and Zvacek (2012) indicated there were advantages and disadvantages to both approaches. Some

students like the synchronous approach because they needed face-to-face instruction; other students preferred an asynchronous approach with more flexibility in learning. Ear, Özden and Arifoglu (2009) suggested that in order to overcome some limitations the two approaches, should be combined and utilized in a way they produced the best results. Even though research tended to favor one approach over another, understanding how technology, in general, impacted students' performance assisted in determining what approaches best suit the needs of the students. However, just as important was the approach the administrators used to have the instruction delivered, which might be influenced by; the school resources, such as staff, space and facilities. Understanding how the method used to deliver instruction with technology and accommodating the students' preference provided the best possible results in promoting the operation of the school and student achievement.

## School Accountability

Currently the research on the use of technology for teaching and learning in education focused on the methods used in delivering instruction. For instance, learning using technology could be a form of distance learning or distance education and computer based learning, which had been around for quite some time (Roblyer & Knezek, 2003). However, a hybrid or blended approach or synchronous approach was popular, as well. Schools using the asynchronous approach delivered instruction entirely over the Internet, hybrid, or blended learning combined traditional face-to-face instruction (Nguyen, 2015). Many of the studies conducted on using technology in

school for teaching and learning, focused on post-secondary undergraduate students (Ary and Brune, 2011; Xu and Jaggars, 2011) or graduate students (Schwartz, 2012; Wilson & Allen, 2012), however, not many studies addressed the application of instructional technology in remote rural high schools. Bernard, Arabmi, Lou, Borokhovski, Wade, Wozney et al. (2004) reporting on the effects of using technology for teaching and learning at all levels, stated that students who learned using instructional technologies, typically had learning outcomes at least as well as students who learned through face-to-face instruction with a classroom teacher. Although, most research was limited to the use of instructional technology in non-rural schools, generalizations about student performance applied to most students. Nevertheless, these generalizations should be given careful consideration when applied to students living and attending school in remote rural areas. One reason being, not only did rural schools and the students attending vary from non-rural schools, but also from other rural schools as well. Therefore, differences existed in the learning styles across the type of students and academic subject areas (Di & Jaggars, 2014).

According to Popham (2009), accountability, initially was as a strategy for improving students' performance, particularly with minority and deprived students. Holding schools accountable for meeting standards suggested that teachers and school officials at all levels would redirect their efforts and find ways to improve schools and student achievement. However, the effects of testing and accountability were both promising and disappointing. Accountability resulted in an increased use of test data,

more testing, more preparation for tests, and an increase focus on instruction.

Nevertheless, Regenstein and Ramero-Jurado (2014) reported that no agreement had emerged from about how to help schools meet state and federal mandates and support student achievement. Although Beck and Schoffstall (2005) agreed that accountability systems changed the manner in which schools operated. Factors beyond the school control such as the unique characteristics of some remote rural schools, and the differences that existed among remote rural school's population, the influence on achievement had not been, thoroughly addressed. Nevertheless, remote rural schools were responsible for student achievement.

Although some studies demonstrated improvements in student achievement when using technology for learning, others found no correlation between access to technology and student achievement (Pedro, 2012). The reason for these mixed results were not fully understood; still, one way to increase the likelihood of improving student achievement, was to focus on a way to successfully incorporate instructional technologies (Best & Dunlap, 2012) for teaching and learning. Thus, there was a growing interest in the use of technology for teaching and learning and the necessity for a system to be developed to evaluate the merit of the content taught as well as, the measures used to evaluate the students' learning (Papadouris & Constantinou, 2009; Schraw, 2010). Although, the incorporation of instructional technologies claimed to support the development of standards to accommodate most states and school district requirements, they might not be on target at increasing student's achievement (Kendall, 2011). Simply put, whether or

not the incorporation of instructional technologies supported academic standards and how the academic standards was evaluated to determine whether students were learning the subject content, was an issue. Remote rural school districts and school administrators alike, resorting to incorporating instructional technologies to support the school and student achievement, faced a greater risk of failure (Pedro, 2012). Although, the incorporation of instructional technologies might be sufficient at different ways of assessing students' knowledge and understanding of subject content, the lack of control over the content or assessments presented some uncertainty. Nguyen (2015) reported that a large number of studies found a positive, statistically significant difference in student learning outcomes using instructional technologies compared to traditional face-to-face instruction. Some of the positive learning outcomes were improved learning as measured by test scores. Overall, there was strong evidence to suggest that using instructional technologies was at least as effective as the traditional format, but the evidence was, by no means conclusive (Nguyen, 2015). Remote rural administrators must contemplate whether incorporating instructional technology was an effective way to support the school and student achievement in school, life, college, and careers.

## Summary

This chapter has provided a framework outlining factors that affected the operation of the school and student achievement in isolated rural schools with limited resources. Then literature review examined rural schools, the characteristics of remote rural areas, the factors affecting remote rural schools, student achievement, and the

incorporation of technology for instruction. Finally, the issue of school accountability was addressed. Although, there were numerous studies focusing on rural schools and student achievement, not many specifically, addressed students attending remote rural high schools. Therefore, a gap existed in literature on the incorporation of instructional technology in remote rural high schools; to manage the school, and to promote student achievement, while, the use was growing.

## CHAPTER III

### METHODOLOGY

Remote rural school districts had unique challenges relative to their isolated locality and few resources. Consequently, remote rural high schools were at a disadvantage, when it came to providing the students with a good quality education. The isolated locality and few resources affected the operation of the school and limited the opportunities for students to experience learning. The effects of the locality and the limitation of resources was that specialized instructional delivery methods and related services were necessary to improve learning for all students (Levin et al., 2011).

Innovation in technology for teaching and learning had the potential to promote student achievement, that is to say, success in school, life, college, and careers. Seaman (2011) pointed out that technology had evolved as a preferred method to deliver instruction in remote rural high schools. Sundeen, T. H. and Sundeen, D. M. (2013) believed preparing students for 21<sup>st</sup> century learning could be facilitated, in part, through

the integration of instructional technologies into the classrooms. This study focused on factors that affected the school and student achievement and the incorporation of instructional technology in one remote rural high school.

This chapter outlined the methodology used to conduct the study, The research purpose, design, and approach, including the rationale for the approach, the setting, site, participate, instruments, data collection procedures, also presented, the data analysis techniques.

### Purpose of the Study

The researchers' purpose was to answer questions pertaining to how the use of instructional technology in a remote rural high school influenced the school and impacted student achievement. The collection of qualitative data captured the extent of the integration of instructional technology and the participant's perceptions of using instructional technology in an isolated rural high school.

### Research Design

This qualitative research study used a standardized procedure: the researcher determined, where the study took place, the time, the participants, and the environments (Creswell, 2014). The goal of the qualitative research was to gain insight; explore the depth, richness, and complex characteristics of the phenomenon (Creswell, 2014). In essence, this case study design provided an empirical inquiry about a contemporary case, or set within a real-world situation (Yin, 2009). In this study, the researcher assumed that

examining the background and other conditions related to the case played an integral part in understanding the case (Stake, 2010). The case study design allowed the researcher to retain the holistic and meaningful characteristics of real-life events (Yin, 2012). A case study research was a good strategy for “what” or “how” questions when the focus was on a contemporary phenomenon within a real-life context and the researcher had little or no control over the event.

For the purpose of this case study, the qualitative case study method, allowed the researcher to use qualitative interviews, qualitative documents, qualitative observations and archival records as the methods of data collection. The researcher collected qualitative data to explain the extent of the integration of instructional technology in the school. The qualitative interviews were the researcher primary data collected method.

The researcher conducted four interviews, with one participant and used observations, documents, and archival records to triangulate the findings. Since the school administrator was the key decision maker in the organization, the study considered the interview as elite (Yin, 2009) since it allowed the interviewee to collect accurate and in-depth data. In addition, the researcher used multiple sources of data including observations, archival records, and documents.

The study examined one remote rural high school, located in a relatively isolated area, with limited access to resources. The case itself, served as the main unit of analysis (Yin, 2009). The research questions that guided the study were “what questions”, which

are indicative of understanding events such as, the use of instructional technology, the operation of the school and students' achievement in an isolated rural high school.

The following research questions guided this study:

1. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school?
2. To what extent does the use of technology in isolated rural high schools impacts students' achievement?

### Setting

This study took place in a small county in southwest Georgia. The population was approximately 24,100 citizens, and the ethnic demographics were 50% whites, 48% African-Americans and 2% Hispanic. The county was primarily an agricultural area with families sparsely located throughout the county. The county was thirty miles from an urban area or suburban area and had limited resources. There was no public or private transportation service, one public library, no museum, and no post-secondary institution. The population depicted high rates of employment, illiteracy, teenage pregnancy, and school dropouts. The majority of the people lived in single family or extended family households, and depended on assistance from state and federal government programs to support their needs.

## Site

The focus of this case study was the county public high school, a relatively remote rural high school with limited access to resources. In this study, the site was referred to as, the county public high school (CPHS). The characteristics of the school, the student population, progress towards meeting the state academic growth target, NCLB goals, their accomplishments, and the use of technology were the reasons for selecting this school.

The school population of 394 students consisted of 0.03 % Asian, 81% African American, and 6% Hispanic and 12% Caucasian. The overall minority enrollment was 88%. The gender makeup of the student population was 48% male and 52% female. The percentage of students' eligible for the free lunch program was 79%; the reduced price lunch percentage was 10%. The school population consisted of 89%, economically disadvantaged students, served students through regular education, special education, and migrant education programs.

There were many different extracurricular activities at the school. Some of the activities included, Tennis, Basketball, Baseball, Volleyball, Football, and Track. The school clubs included; National History Day (NHD), Art Club, Drama Club, Family, Career & Community Leaders of America (FCCLA), Math Team, Health Occupations Students of America (HOSA), Junior Reserve Officer Training Corps (JROTC), Eagles News Crew and the Robotics Team. The various clubs and team earned the school

awards for their achievements. In addition, there were after-school programs that offered extra academic instruction for students.

This study used data from interviews, observations, the Georgia State Longitudinal Data System (SLDS), the State Department of Education, Governor Office of Student Achievement, documents and archival records maintained at the county high school.

### Participants

The criteria for the participant in the study included an individual, who was a key player in the organization and had experiences in education in various capacities. In addition, the participant was familiar with the process of the integration of instructional technology and responsible for the total operation of the school. In this study, the participant was referred to as the site head administrator (SHA).

### Role of the Researcher

The credibility of the research was vital, therefore; it was important for the researcher to identify personal values, assumptions and biases at the beginning of the study. As the researcher in the study and an employee of the organization in the study, the researcher reported data honestly, fairly and without biases, however; the researcher shared personal and professional opinions with the readers. The researcher in this study followed ethical guidelines, disclosed necessary information, adhered to confidentiality,

and made sure the data collected protected the participant, the institution, and researcher.

In addition, the researcher followed the case study protocol.

### Personal Disclosure

Although the researcher in this study was an employee of the school system where the study took place, the researcher did not actively participate in the study. The researcher did not have any stake in the outcome of the study other than provided information. The researcher consulted with the methodologist, and determined whether a proposal for approval by the university campus institutional review board (IRB) was necessary to conduct the study. In addition, the researcher consulted the code of ethics of the American Psychological Association (2010).

### Ethics

Since the study involved collecting data from people and about people, the researcher anticipated ethical issues that might arise during the collection of data. Therefore, the researcher followed all ethical guidelines and did not engage in any misconduct that reflected on the institution, the site, and participant in the study.

### Confidentiality

One possible risk involved in the research was that of confidentiality. The researcher abided by the code of ethics of the American Psychological Association

(2010) and respected the privacy, anonymity, differences in culture, gender; religion and any other differences are indigenous of a society. The study reported no personal information that identified the participant, minimal or no risk was involved in the study.

## Instrumentation

Based on the research questions, the researcher selected the instruments and decided how to use them. The research questions and the design of the study provided the need for multiple sources of data, and the instruments used in the study to collect the data were interviews, observations, documents, and archival records. The researcher developed a guideline for conducting interviews and observations. Prior to the collection of the data, the researcher formulated a data collection plan (Creswell, 2012).

## Instruments

Since the researcher was the person who collected and analyzed the data in qualitative research. The researcher in this case study was the major instrument (Yin, 2012).

*Interviews.* The researcher used one unstructured, open- ended interview and three semi-structured, open-ended interviews that assessed the participant perception of the process of the integration of instructional technology in the school.

*Observations.* The researcher used one unstructured observation and two structured observations to note events that occurred at the site to help explain the process of the integration of instructional technology.

*Documents.* Documents obtained from the Georgia Department of Education (GaDOE) included but not limited to the site Newsletter, Site Main Web Page, Site Handbook, School Improvement Plan, Curriculum Guide, Title I Plans, School, Technology Report, Master Schedule, Course Syllabus, County Census Report and Pre-exiting survey results from students, parents, teachers, and stakeholders were collected by the researcher.

*Archival Records.* The researcher collected electronic data obtained in the Georgia State Department (GaDOE), Governor Office of School Accountability (GOSA) and the Student Longitudinal Data System (SLDS).

## Data Collection

Data were collected by gathering and measuring information on variables of interest, in a systematic way that enabled the researcher to answer stated research questions, test theories, and evaluate outcomes (Stake, 2010). In this qualitative study, one researcher, described and explained the phenomena, and carried out the research. The researcher had the flexibility to use an instrument that best fitted the phenomena under study, identified the appropriate instruments, and specified the variables and data needed for the study (Creswell, 2014).

The researcher developed a data collection plan (Appendix B) that facilitated the data collection process. The data collection plan used the questions derived from the case study; showed the data collected, the sources, and the purpose of the data collected. The researcher developed a tentative timeline (Appendix C) that facilitated the data collection process. The researcher collected the data during the 2016-2017 school term, over a 6-month period. In addition, the researcher developed and used an interview protocol. The interview protocol (see Appendix D) included the following components: heading (type of interview, date, interviewer, and interviewee), instructions for the interviewer to follow, a set of questions derived from the case study with a space to record responses. The researcher developed and used an observation protocol. The observation protocol (see Appendix E) included the following components: heading (observer, type of observation, date, place, time, duration of observation, items (who, setting, behavior/dialogue, and event/activity) and a space used to describe the items.

The strategy used to collect the data, allowed the researcher time to examine the data, seek more details, and clarify the data collected. The use of a strategy enabled the researcher to collect the data in a logical and organized manner. The process continued until the researcher gathered enough evidence to answer the research questions.

The researcher created a case study notebook and stored the data collected during the study. The case study notebook consisted of three main sections, with the main sections separated into several parts. The first main section labeled instruments, was separated into four sections, interviews, which was comprised of two parts; qualitative

interview memos and report, observations, which was comprised of two parts, qualitative observation field notes and report, documents, which was comprised of three parts, public, private and reports. The fourth section, archival records, was comprised of three parts, tables, figures, and reports.

The second main section of the case study notebook, labeled qualitative data, were separated into six topics, the first topic, rural schools, and remote rural school. The second topic attributes of remote rural areas was divided into three parts: geographical location, population, and community. The third topic factors influencing the operation of the school were divided into five parts: funding, recruitment, and retention of teachers, parent and community involvement, motivation and technological resources. The fourth topic, factors impacting student achievement were divided into three parts: students' physical attributes, social cognitive abilities and preference for course selection and delivery method. The fifth topic opportunities for learning were divided into two parts: instructional technology, and delivery methods. The last topic was labeled school accountability.

The third main areas of the case study notebook, labeled quantitative data were divided into two areas. The first area the demographics were divided into four parts participants': setting, site, and staff. The second area was divided into four parts: tables, illustrations, spreadsheets, and summative reports.

Initially, the researcher's case study notebook was used to store all data collected and later was transferred to the researcher's personal computer. The computer was located in

the researchers' office. The researcher created a password-protected folder on the researcher password-protected personal computer. The researcher entered the data collected into a word processor program (Microsoft Word). The researcher made a copy for the personal data storage drive and a hardcopy for the case study notebook. The data will be stored for a period of five years and accessed only by the researcher and site head administrator.

Although audiotapes and videos may produce a more accurate rendition of interviews and observations than any other methods, there are certain situations where the researcher may choose not to use a recording device (Yin, 2012). The researcher did not use an audio or video recording device during interviews or observations for the following reason: the study presented a special case, elicited personal comments, and conveyed a deep exploration and thorough examination of the problem.

### Data Collection Procedures

During the fall of the 2015-2016 school year, the researcher contacted the school district office by phone and asked for permission to conduct a research project at the county public high school, as required for a doctoral degree. The researcher obtained a signed letter of cooperation (see Appendix F) granting permission to use the county public high school in the research project from the chief administrator of the school.

After obtaining the letter of cooperation and final IRB approval (see Appendix G), from the university, the researcher met with the head administrator of the county high school, in an office located at the school, and discussed the research project: purpose,

design and methodology. The researcher expressed the importance of having the head administrator of the county high school as a participant and needing access to documents and archival records maintained by the county high school and the need to have consent to participate (see Appendix H).

The researcher followed up the initial contact (see Appendix H) with the site head administrator (SHA). The researcher confirmed the verbal agreement to participate in the research study and gave the participant a copy of the Informed Consent (see Appendix I). The researcher provided a verbal explanation of the items outlined in the informed consent, confirmed an understanding of the form, and stressed the need for consent.

Upon receiving the signed Informed Consent Form, the researcher and the participant mutually agreed upon a scheduled time, and place for interviews, observations, and the collection of the documents and archival records maintained at the county high school.

### Conducting Interviews

The researcher conducted four open ended face-to-face interviews with the site head administrator. All interviews were conducted by the researcher, at the site, after or before the site hours of operation, in the site head administrator's office. The time of the interviews varied, but lasted no longer than 30 minutes. The researcher engaged in purposeful conversation in a way that solicited detailed information about the case. In the semi-structured interviews, the researcher organized the interview protocol into three parts, and asked a limited number of questions during the interviews. In doing so, the

researcher collected detailed information and adhered to the mutually agreed upon guidelines.

The first interview, an unstructured open-ended face-to-face was conducted by the researcher at the site after the site's hours of operation used a conversational type style. The researcher collected the data to depict a rich description of the case and participant in the study. During the interview, the participant shared information, facts, opinions, and concerns about the site. The researcher listened for spoken words, phrases, and statements heard during the interview related to the main and sub topics included in the literature review. During the interview, the researcher recorded the interviewee responses on a standard sheet of paper that listed the main topics found in the conceptual framework and the literature reviewed for the study. Following the interview, the researcher read the data collected. The data were labeled qualitative interview memos and placed in the researcher's case study data notebook.

The second interview a semi-structured, open-ended face-to-face interview conducted by the researcher at the site after the site's hours of operation, and used the interview protocol. The researcher collected data that depicted a rich description of the use of technological devices in the school, the procedures in place to access the devices, the assistance provided for equipment malfunction and issues that arose with the technological devices. During the interview, the researcher recorded the interviewee responses on the interview protocol form. Following the interview, the researcher read

the data collected and composed a memo. The data were labeled qualitative interview memos and placed in the researcher 's case study data notebook.

The third interview a semi-structured, open-ended face-to-face interview was conducted by the researcher at the site after the site's hours of operation and used the interview protocol. The data collected described the use of technology for teaching and learning at the school. The interviewer asked questions about the technological devices used for instruction, how the technological devices used for instruction were aligned with the school district's curriculum, how the students feel about using technological devices for instruction, and what kind of support was provided to students using technological devices for learning academic subject content? During the interview, the researcher recorded the interviewee responses on the interview protocol form. Following the interview, the researcher read the data and composed a memo. The data were labeled qualitative interview memos and placed in the researcher's case study notebook.

The fourth interview, a semi-structured, open-ended face-to-face interview conducted by the researcher at the site after the site's hours of operation and used the interview protocol. The data collected explained the outcome(s) of using technology at the school. The researcher collected data that described the outcomes of using technology for managing the school and delivering instruction to students. During the interview, the researcher recorded the interviewee responses on the interview protocol form. Following the interview, the researcher read the data and composed a memo. The data were labeled qualitative interview memos and placed in the researcher 's case study data notebook.

After all the interviews were conducted, the researcher, composed an electronic narrative that provided a detailed discussion of the interviewee perspective, quotations and responses to the interview questions. The researcher's case study notebook was used to store the data under qualitative interview report.

### Conducting Observations

The researcher conducted three observations, one unstructured and two semi-structured at the site, before and during the site hours of operation. The data collected during the observations helped the researcher describe the site, the technological devices found at the site, and the role of instructional technology at the site. The researcher used the data collected from the observations and explained and describe what occurred. The researcher also used the data to triangulate the data collected from interviews and documents as well.

The first observation (unstructured) conducted by the researcher at the site before the site hours of operation, lasted no longer than thirty minutes. The researcher observed the site structure, condition, size, resources, location, and characteristics. While observing, the researcher hand recorded what was observed on a standard sheet of paper. Following the observation, the researcher composed notes. The data were labeled qualitative observation field notes and placed in the researcher's case study notebook.

The second observation (semi- structured) conducted by the researcher at the site after the site hours of operation, used the observation protocol, and lasted no longer than thirty minutes. The primary focus was to determine the kind and quantity of

technological devices used at the site. During the observation, the researcher recorded the names of the technological devices and how devices were used on the observation protocol form. Following the observation, the researcher composed notes. The data were labeled qualitative observation field notes and placed in the researcher's case study notebook.

The third observation was semi- structured, conducted by the researcher at the site during the hours of operation and used the observation protocol. The researcher focused on how, when and where the instructional technology was used at the site. In addition, the researcher observed specific situations using instructional technology. The researcher recorded the data by hand writing notes during the observation on the observation protocol form. Following the observation, the researcher composed notes. The data were labeled qualitative observation field notes and placed in the researcher's case study notebook.

After all observations were conducted, the researcher, composed an electronic report that provided a detailed discussion of the observations. The researcher labeled the data qualitative observation report and placed the data in the researcher's case study notebook under qualitative observation report.

### Collecting Documents

The researcher collected public and private documents maintained at the school. The data collected helped the researcher explain the phenomena and triangulate data collected from interviews and observations. The researcher collected public documents

such as the school handbook, master schedule, School Strategic Plan, curriculum guide, School Improvement Plan, Title I Plan, and the school Technology Plan. The researcher collected private documents such as the responses and results of preexisting surveys taken by administrators, teachers, students, parents and stakeholders relevant to the site and memos shared by the participant having to do with the site.

After all documents were collected, the researcher examined the documents and composed an electronic report summarizing the data. The researcher labeled the data and stored the data in the case study notebook under qualitative documents reports.

### Collecting Archival Records

The researcher collected archival records maintained by the site and stored as electronic records for the 2015-2016 academic year. The researcher collected electronic records such as grade reports, the school Accountability Report Cards, the County Census Reports, Governor's Office of Student Achievement (GOSA) reports, and College Career Readiness Performance Reports (CCRPI), and Georgia State Longitudinal Data System (SLDS) reports, and school climate reports posted on the State Department of Education (DOE) website. Following the collection of archival records, the researcher examined the data.

After all data were examined, the researcher composed electronic spreadsheets, tables and diagrams. The researcher, composed a detailed description of the data, tabulated the data and calculated the data. The researcher, composed a typewritten

narrative summarizing the findings, labeled the data, and placed the data in the case study notebook under quantitative archival records reports.

## Data Analysis

The data collection process and data analysis occurred at the same time and happened continuously throughout the research in this case study (Creswell, 2013). The researcher read and analyzed all data collected using a data analysis technique called content analysis (Yin, 2012). Content analysis allowed the researcher to examine interviews, observations, documents, archival records for context related to the conceptual framework, the list of research questions, and the literature reviewed. The researcher developed coding schemes based on the coding schemes of Creswell (2014) that enabled the researcher to analyze the data.

Since documents contain data that no longer can be observed, provide details that informants have forgotten, provide background information, and can track change and development in organization, the researcher, collected documents such as the school improvement plan, the school title one plan, the school technology plan, the county census report, and the school report cards. The researcher audited the documents by carrying out the following steps .

1. Made copies of the original documents.
2. Assessed the authenticity of documents
3. Determined who produced the document, why, when and for what.
4. Explored the document's agenda and the content of the documents.

##### 5. .Explored the purpose of the documents

After auditing the documents and determining that the documents contained relevant text, the researcher included the documents in the data analysis process.

During the first phase, the researcher created a set of primary codes (see Appendix J), which presented six major categories derived from the literature reviewed for this study. The researcher read and examined all the data from interviews, observations, documents and archival records and identified phrases, topics, subjects, and ideas about an isolated rural high school, student achievement and the incorporation of instructional technology. The researcher identified and coded the data, based on the six major categories.

In the second phase, the researcher reexamined all data from interviews, observations, documents, and archival records with identical codes. The researcher analyzed each of the six major categories for factors that influenced each category. The research created an electronic spreadsheet and listed the factors derived from the major categories. The data from each category revealed several themes.

In the third phase, the researcher created a secondary set of codes (see Appendix K) that represented three broad categories, namely: a). Enable Success of the school and students' performance, b). Hinder Success of the school and students' performance and c.) Support Success of the school and the students' performance. The researcher reexamined and analyzed the themes derived from each of the six broad categories for words and phrases that described the impact of the themes on the school and students'

performance. The researcher identified and coded the themes based on the secondary codes. The researcher grouped the themes, and tallied each of the three board categories. The researcher compared and analyzed the data in each category.

In the fourth phase, the researcher read and analyzed the data in all categories for ideas, concepts, actions, relationships, and meanings relating to the purpose of the study. From reexamining and reanalyzing all the data in all categories, four themes emerged.

In the fifth phase, the researcher created another set of codes (see Appendix L) that represented the four emerging themes. The researcher identified, labeled, and grouped the data, as it related to the themes that evolved from the data analysis.

The sixth phase, the researcher generated descriptive statistics about the site, setting, population, and the school and the students' performance. The researcher analyzed the data, created tables, calculated the data, and displayed the data as descriptive statistics. The researcher used the data as a criteria and made judgements about the phenomena.

For the final step of the data analysis, the researcher summarized all qualitative and quantitative data and linked the data by themes to the theoretical literature reviewed in the study. The researcher used the data to depict a rich description and explanation of the case studied. The description and explanation of the case studied were computer generated using Microsoft Word 10 and filed in the researcher's case study notebook in the appropriate section.

## Reporting of Findings

The researcher reported the findings in a way that addressed the answer to the two central questions and provided a theoretical explanation based on theories derived from the literature review. The researcher matched the data and used the data to explain and address theories that supported the evidence and substantiated how the event had or had not occurred. Also, the researcher compared the explanation given in this study to the explanation that had been originally suggested in the theory (Yin, 2009).

The researcher presented the results of the findings from both qualitative and quantitative data in narrative, and tabulated form. Presenting the results in a narrative and tabulated form allowed the researcher to explain the findings in a way that conveyed a holistic picture of the phenomena. Then the researcher provided an answer to the two central research questions as they related to existing knowledge, and theories (Yin, 2009), based on the themes that evolved from the findings and analysis of the data from the study.

## Evaluation of Research Methods

Selecting an ordinary case that has never been associated with any unusually successful outcome made the case noteworthy (Yin, 2009). The study covered an organization (a remote rural high school), a common everyday phenomena (technology for teaching and learning), and real life content (achievement in school, college, life,

careers). In addition, the study provided a conceptual framework a thorough review of literature and used multiple instruments to collect data.

### Validity of Findings

Validity was a vital aspect of case study research Creswell (2012) pointed out, researchers based validity on the standards of internal and external validity, construct validity, and reliability. However, qualitative researchers Denzin and Lincoln (2011) and Yin (2012) rejected the framework of validity based on those standards, and suggested that in qualitative research the value of the research relied on the criteria of trustworthiness.

### Trustworthiness of the Research

Validity referred to the accuracy and trustworthiness of the instrument, the data, and the findings in qualitative research (Yin, 2009). The researcher showed that the study was valid based on the measures of credibility, dependability, confirmability, and transferability (Yin, 2009; Denzin & Lincoln, 2011). A brief definition of the measure and an explanation of how the researcher accomplished each followed.

*Credibility.* Ensuring the credibility of the research involved establishing that the results of the research were believable (Yin, 2009). The researcher established the credibility of the study in several ways. First, the researcher worked with the methodologists and assured that the correct data collection measure applied to the concept studied. The researcher used multiple sources of evidence. In addition, the

researcher adhered to the Code of Ethics and Institute Review Board policy for conducting research.

Next, the researcher established a case study database, a chain of evidence, and a path to follow such as a case study notebook. The case study notebook stored the case study notes, documents, narratives, tables, illustrations, and reports. Finally, the researcher provided a draft of the case study and had it reviewed.

*Dependability.* Dependability referred to the consistency in the processes of gathering, analyzing, and interpreting the data Yin (2009). To ensure the dependability of the data, the researcher followed the case study protocol, provided an overview of the case, followed the procedures for collecting data, developed research questions and procedures for reporting findings. The researcher's dissertation committee confirmed the soundness of the findings.

*Confirmability.* The concept of confirmability referred to the development of a logical understanding of the data, so that other researchers could substantiate it. To ensure the confirmability of the study findings, the researcher verified the data by using two or more sources, and checked for consistency of the findings noted in interviews and observations. The researcher used the data from archival records and documents and verified the data.

*Transferability.* Transferability was the process of being able to generalize from the research finding to other situations. However, generalization was not the purpose of the case study research (Stake, 2010). The researcher presented the case in a way that

solicited an awareness of the uniqueness of the phenomenon, developed an understanding of the case, and verified that a causal relationship existed between what and how certain conditions lead to other conditions. In addition, the researcher described a unique teaching and learning experience that allowed the readers to make assumptions.

## CHAPTER IV

### REPORT OF DATA/ DATA ANALYSIS

This chapter presented the findings of the data collected from interviews, observations, documentation, and archival records. The chapter first addressed the research design and data analysis; secondly, the findings of data included a demographic profile, emergent themes, and a summary of the findings. Finally, the researcher provided an explanation and discussion of the findings.

The focus of the study was to contribute to the knowledge base about instructional technology as it pertained to promoting student achievement in one remote rural high school, located in a small rural town in the southern part of the United States.

The aim of the study was to explain the extent to which the use of instructional technology in a remote rural high school influenced the operation of the school and impacted students' achievement. The researcher used several instruments, collected data and asked open-ended questions that focused on the experiences of the site head administrator within the school and addressed the overarching question of the study, "how to incorporate instructional technology in an isolated rural high school to promote

student achievement”. The researcher formulated two central questions that guided the study.

1. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school?
2. To what extent does the use of technology in isolated rural high schools impacts students’ achievement?

### Research Design

A qualitative single case study (Stake, 2010, Yin, 2012, Creswell) design was used to capture the experiences of an isolated rural high school and the perspective of the site head administrator (SHA) regarding the extent of the use of instructional technology in an isolated rural high school. The researcher collected data from interviews, observations, documents, and archival records.

### Data Analysis

In this single case study, qualitative data analysis came primarily from the interviews with the site head administrator, the key informant in the case study. The interviews with the key informant provided a rich source of data. In addition, the researcher analyzed data collected from observations, documents, and archival records.

The interview as the main data collection instrument, allowed the participant to share opinions, facts, and concerns about herself, the site, and the events that occurred at

the site. The analysis of the data allowed the researcher to explain the use of the instructional technology and point out evidence that showed what was happening with instructional technology, and how using it generated outcomes in education.

The second data collection method was observations. The observations allowed the researcher to collect data about the physical and social aspects of the site (school), the kinds and number of technological devices found at the site and the activities that occurred and the effect of such activities on the site. The analysis of the data enabled the researcher to depict a rich description of the site culture and climate. In addition, the researcher, gained insight related to the use of instructional technology in an isolated rural high school.

The third data collection instrument was documents. The researcher collected documents prior to the interviews. Documents collected provided useful information about the setting, site, and the school. The analysis of the data provided useful information that enabled the researcher to establish how long the practice of using instructional technology had been in place and why it, was used.

The fourth data collection instrument was archival records. The researcher collected some records prior to interviews and observations. The data collected provided numerical information. In addition, the researcher used the data to triangulate the findings reported during the interviews, what the researcher reported and observed at the site.

## Report of Findings

The researcher presented the findings of data by themes in narrative and tabular form that explained and described the phenomena-taking place in the study. The findings led to the answer to the overarching question and the two central questions that guided the study.

## Demographic Profiles

### Participant

The participant, the site head administrator (SHA), a female experienced in education at the secondary level had worked in various capacities at the county high school during her twenty years in education. During her tenure, she served as a ninth grade remediation teacher in Language Arts, an English teacher in grades ten to twelve, and an instructional leader in the Freshman Academy. In addition, she served on the administrative team and on various school committees. She supported the acquisition of instructional technology. The SHA was responsible for the total operation of the school, familiar with the technology used at the county public high school (CPHS) and with the integration of technology at the site (school).

Findings from school records revealed that the school head administrator was an African American female who graduated from the school, taught at the school, and had twenty-five years of experience in education in various capacities at the school.

Therefore, her familiarity with the school suggested that her account of the school past and present activities and events were accurate.

### Setting

The study occurred in a small town in southwest Georgia. The proximity of the county was within 30 miles of urban or suburban area. The county had a population of 23,496 persons, 49.6% white, 47.9% black, 2.1% Hispanic, and 1.3% from other races. More than 26% of the population incomes were below the state guidelines for poverty and the illiteracy rate was high. The manufacture and selling of products from poultry and farming generated most of the revenue for the county. The unemployment rate was high and most of the families relied on assistance from the state or federal government. The county had one public library, no public transportation, one hospital, no museum, no zoo, and no post-secondary institution; however, the county had a good infrastructure for technology.

The county school system served a diverse socioeconomic and ethnic population. The county had one public high school, one private school, one charter school, one middle school, and two elementary schools located in various communities. An independent school system was located in a nearby town in the same county. The pupil per expenditure was above the state per pupil expenditure. The school system's largest ethnic group was African American. The school system provided regular education,

special education, and migrant education services. The county public high school (CPHS) was the focus of the study.

Data found in the County Census Report revealed that the county was 30 miles of an urban or suburban area. The county had limited health, education and recreational resources, the manufacture and sell of poultry and farming produced most of the income for the county. The unemployment rate was high and many of the families' incomes were below the state guidelines for poverty. Most of the families relied on assistance from the state or federal government to support their personal needs. The county had six schools located in various communities throughout the county and the pupil per expenditure, were above the state. Therefore, the county had few resources and difficulty supporting the needs of the families, community and schools, but one positive aspect was the investment the county made in acquiring the infrastructure for technology.

### Site

The county public high school (CPHS) which was the focus of this study was built in 1982 and sits off a state highway outside the city limits, surrounded by agricultural businesses. The school served students in grades 9-12. Over the years, due to additional funds made available through special tax, the school received some renovations. The wings were divided into distinct areas such as the college, career technical academy, freshman academy, military science, special needs, and alternative education. The career- technical academy area, divided by career –technical pathways, had several distinct areas. The career-technical academy had a graphic arts shop,

production room, radio station (WMCZ-LP, 94.5 FM), a restaurant for culinary arts, a greenhouse for agricultural science, an early childhood center for early childhood education, a medical clinic for healthcare science and a beauty salon for cosmetology.

CPHS had the broadband capability for high-speed internet access with wireless capabilities and the ability to access to 1 GB on desktop computers. All classrooms, labs and the media center were equipped with desktop computers. At least two television were located on each hallway, and in all classrooms. The media center and two additional classrooms were equipped with smart televisions. Digital signs were located outside and inside of the building. In addition, the school had a bus equipped with 20 laptop computers, printer, and a Promethean board. The bus served as a mobile computer lab and the school staff drove the bus to various communities to support the students and their families' who needed access to computers and the internet for educational and personal needs.

### Student Population

The school student population consisted of a diverse group of students with similar characteristics: low socioeconomic status, family incomes that qualified free or reduced lunches. A disproportionate number of them were females and minorities. The majority of the students lived on farms, in housing projects in town, and single parent households. The head of the household were females with low or no family personal income. The students' primary mode of transportation to and from school was the county school buses.

Findings of data in archival records such as the State Department of Education, School Accountability Report displayed in Table 1 portray the three-year trend in the schools' student population demographics by percentages.

Table 1

*Three Year Trend of Student Demographics by Percentages*

Year	2013-2014		2014-2015		2015-2016	
Student total enrollment	392		405		389	
Variables	n	%	n	%	n	%
Asian	1	0.0%	2	1.0%	2	1.0%
African American	325	83%	330	82%	322	82%
Hispanic	22	6.0%	23	6.0%	31	7.0%
Multiracial	0	0.0%	0	0.0%	1	0.0%
Caucasian	44	11.0%	50	12.0%	35	8.0%
English to Speakers of Other Of Other Language (ESOL)	1	0.0%	1	1.0%	1	1.0%
Special education	22	5.8%	25	6.3%	24	6.3%
Free/reduce lunch	384	98%	396	98%	346	89%
English Language Learners (ELLs)	2	0.0%	2	0.0%	0	0.0%
Migrant	3	1.0%	0	0.0%	0	0.0%
Economically disadvantaged	384	98%	396	98%	346	89%

Table 1 Three -Year Trend of Students Demographics by Percentages, reported CPHS served under 500 students and ninety-eight percent of the students were eligible for reduced or free meals. The school served a large minority population; with African American, being the largest group served. On the average, 6% of the student population required received compensatory educational services such as students with disabilities (SWD) and English Language Learners (ELLs).

Data from archival records such as the State Department of Education, School Accountability Report, as shown in Table 2 provide a breakdown of CPHS population based on their ethnicity and gender during the 2015-16 school years by percentages.

Table 2

*Percentage of Student Population by Ethnicity and Gender*

Ethnicity	Gender				Total	%
	Males		Females			
	N	%	N	%		
Caucasian	18	4.6	17	4.3	35	8.9
African American	137	35.2	186	47.8	322	82.7
Hispanic	18	4.6	13	3.3	31	7.9
Other	1	<1			1	< 1
Total (N) = 389	172	44.2	217	55.7		

As shown in Table 2 Percentages of Student Population by Ethnicity and Gender showed eighty-three percent of the student population were African Americans. Eight percent of the student population was Caucasian and Hispanics made up 7% of the student population. The majority of the students served were African American females (48%) followed by African American males (35%).

### Staff

Findings of data from interviews showed that CPHS has a small staff that provided services and support to students, their parents, and the community. Findings of data in archival records such as the State Department of Education, School Accountability Report, as shown in Table 3, display a three-year trend of the demographic profile of the certified staff by percentages and included certification level,

gender, positions, ethnicity, years of experience and the number of positions filled each year.

Table 3

*Three Year Trend of Certified Staff Demographics by Percentages*

School Year	2015-2016		2014-2015		2013-2014	
Variables	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Certification level						
Bachelor	21	45.6	21	50.0	23	52.2
Masters	19	41.3	15	35.7	15	34.0
Specialist	5	10.8	6	14.2	7	15.9
Doctoral	3	1.3	3	7.1	3	6.8
Other	1	<1	1	<1	1	<1
Gender						
Male	15	5.9	13	30.9	13	29.5
Female	34	15.1	33	78.5	36	81.8
Positions						
Filled	46	100	42	100	44	100
Ethnicity						
African American	13	28.2	13	30.9	13	29.5
Asian	6	13.0	6	14.2	6	13.6
Caucasian	26	56.5	26	61.9	29	65.9
Native American	1	<1	1	<1	1	<1
Year of Experience						
< 1	0	0.0	0	0.0	3	6.8
1-10	10	4.6	10	4.2	10	4.4
11-20	14	6.4	14	33.3	18	40.9
21-30	17	7.8	17	40.4	13	29.5
> 30	3	6.5	5	11.9	5	11.3

As shown in Table 3, Three- Year Trend of Demographics of Certified Personnel by Percentages, in terms of personnel at an average the school employed 36 certified educator. In terms of the level of certification, on the average 50% of the certified staff held a Bachelor level certification, 37% Master level certification, 13% Specialist level certification and 5% were certified at the doctoral level. In terms of gender, the majority of the certified employees were females. In terms of the ethnicity, 60% of the certified employees were Caucasians, 29% African American, and, Asian made up 13% of the

certified employees. In terms of experience in education, the majority of the certified staff had more than 21 years of experience, and only 4% of the certified staff employed had 1-10 years of experience.

CPHS staff consisted of a relatively small, stable, and diverse group of certified educators. The certified staff mean years of experience in education was 18.6 years

## Emergent Themes

Four important themes emerged that provided insight about the practice of the use of instructional technology in a remote rural high school to promoted students' achievement. The researcher used the themes and provided a rich description of the case and a detailed explanation of the findings.

The four major themes were: 1) the process of incorporating instructional technology, 2) purposeful use of instructional technology, 3) outcome of using instructional technology, and 4) resource requirements.

### Theme 1: Process of Incorporating Instructional Technology

During the first open-ended unstructured interview, the site head administrator (SHA) was asked to share information about her, reflect on the site, and provide facts, opinions, and concerns about the site.

In reflecting, the SHA, said,

I attended high school, here at the county high school, graduated, went to college, and later obtained my first job in education here at the county high school. She further stated she had worked at the school for twenty-

five years, and witnessed several changes in the county, school, the students, families, and the communities. Some of these changes were favorable, but many created obstacles for the school (SHA, personal communication, December 3, 2015).

When discussing her concerns, the following words or topics surfaced, cutbacks in funding, teachers experienced furloughs, the community lacked interest, parents lacked of participation in their child's education, few educational resources, and technology.

The site head administrator (SHA), said,

The students' attendance and their lack of desire to participate in learning was agonizing. Although the infrastructure for technology was adequate; however, the majority of the students lacked access to computers, and had poor or no connection to the internet (SHA, personal communication, December 3, 2015).

Findings of data in the archival records showed that some years prior to the study CPHS had struggled to meet state accountability measures on student assessments, attendance, and graduation rate. The school was rated "need improvement". In addition, the school needed to address funding, technology, the teacher turnover rate, high absenteeism among students, disciplinary incidents, high dropout rate, low parent and community involvement, poor academic performance and motivation.

During the interview the SHA, stated, "CPHS found a way to address, not just the academic needs of the school but other needs as well." The SHA believed the

innovations in technology played a vital role and the administrators realized the value of technology. She further revealed that in the beginning, the use of technology was limited to communicating, storing data, grading, attendance, and scheduling. The SHA pointed out that teachers did not use technology in their instructional practices, and the students' use of technology was limited.

In the opinion of the SHA, the use of instructional technology played a key role in enhancing the educational practices of the school. She emphasized the importance of using instructional technology in an isolated rural high school to address not just academic needs, but the personal, professional, and social needs of the school, staff, students, parents, and community. It changed the culture of the school. The SHA believed that instructional technology changed the physical appearance of the school and the way the school conducted its business. According to the SHA, "The use of instructional technology to address both the academic and nonacademic needs of the school had proved to be successful."

The School Accountability Report, shown in Table 4 displayed the CPHS School Climate Indicator Scores. The school climate measures included factors such as the responses from students, teachers, staff, administrators, and parents about the overall practices and condition of the school, student discipline, safe and drug free learning environment, and the school wide attendance.

Table 4

<i>CPHS School Climate Score by Indicators</i>		
School Year	2016	
		Score
<b>Indicators</b>		
School Perception Survey Responses		
Student Response (Health)		64.84
Teacher/Staff/Administrator Response (Personnel)		80.33
Parent Responses		82.63
Average School Perception Survey Response Score		75.93
Student Discipline		
Suspension Rate		91.57
Average Student Discipline Score		91.57
Safe/Substance -Free Learning Environment		
Student Drug Related Incidents		100.00
Violent Incidents		83.82
Bullying and Harassment Incidents		100.00
Average Safe and Substance –Free Learning Environment Score		88.83
School Wide Attendance		
Student Attendance		76.355
Average Daily Personnel Attendance		97.184
Average Daily Administrator Attendance		98.637
Average Daily Staff Attendance		97.405
Average Mean School Wide Attendance Score		92.404
Average Mean Score	(Average of 4 indicators)	87.188
<b>Note:</b> Score range= Excellent (>89.5) Good (89.4-83.4); Average (83.3-77.3); Good (77.2-71.2); Need Improvement (<71.1) State Department of Education		

Table 4, School Climate Indicators Score indicated that the school climate score was 76, which was good. The average safe and substance free learning environment score was 88. The school average mean school wide attendance score was 88.

Findings from an unstructured observation indicated that the school building was well- kept on the inside and outside. The staff and students followed a highly structured routine. There was a minimum amount of noise in the hallways, teachers monitored the students, and the students arrived to school prepared to learn.

Findings from data suggested that more people were interested in the school, the school environment was safe and drug free, the overall attendance of the students and

staff had improved, the students' behavior at school had improved, the school atmosphere and appearance were good.

However, the SHA stated, "The perception of the school needed to improve because the staff, community, students, and parents felt that the school needed to provide more opportunities for learning and access to technology."

Findings of data from preexisting surveys revealed that although the perception of the school had changed students still needed to know; what a computer was, how to navigate a computer, how to save files, some commonly used technological devices, and software applications and how to access resources. The staff needed to use technology for teaching and learning and the community needed to see technology used more in the school.

Findings from data in public documents indicated that the school introduced the parents and community to technological during workshops, and at other school events and activities. Findings of data from the school curriculum guide showed that all students were required to take an introductory computer class. CPHS staff had exposed parents and students to computers. The students had acquired the skills needed to operate computers and used computer software programs.

During the interview, the SHA said, "Although students were coming to school they did the minimum required to graduate." The SHA, believed students needed to be encouraged to do more than the minimum required to graduate, if they wanted to be successful.

The SHA stated,

Even though the school had many issues, most of the students who attended the school were eager to learn and the parents' had high regards for the school but were unable or not willing to come to the school to support their children's education (SHA, personal communication, December 3, 2015).

She emphasized that the school had to find a way to address the issues. In her opinion, student's lack of motivation, confidence in their ability to learn and beliefs about education manifested from the beliefs of families living from generation to generation in poverty. To change the students and their parents' attitude about education, they had to understand how a good education could be rewarding. The SHA, felt the school had to change the parents, students and community mindset about the school and learning.

The SHA responded,

“Although, the students were intellectually inclined to do well in school, they lacked the desire, and initiative to further their education was apparent. Parents did not show much interest in their child's performance in school, encourage their children to enter higher institutions of learning or seek credentials' needed for employment.”

CPHS faculty understood how the condition of the environment influenced the families' and students' attitude, thinking, and behavior about the school, education, and learning. During the interview, the site head administrator (SHA) stated, “Often students

in isolated rural areas do just enough to pass, but needed to do more and understand the relevance of an education.”

The SHA stressed that students’ attending school in remote rural areas needed experiences like the ones they encountered in the real world at school. More importantly, students in remote rural schools needed skills for jobs before they left school.

CPHS administrators’ believed that using technology and emulating real life experiences inspired and motivated students to learn, experience the benefits of learning, and understand the value of an education. Therefore, CPHS staff strategically planned and used instructional technology in a way that enabled the students to experience learning in real-life situations and problem solving.

During the process of planning for the incorporation of instructional technology CPHS administrative staff identified their concerns, which included: school management, administrative practices, instructional practices, parent and community involved, motivation, engagement in learning, expectations in school, students’ performance and additional opportunities to experience learning.

CPHS staff had established goals for using technology. These goals were; to address restraints in the school budget, to eliminate the need for teachers, to access resources, to motivate students to come to school, to become more proficient in using technology, to engage parents in their child’s education, to increase the community involvement and to promote the students’ achievement in school, college, life and careers

CPHS administrators' knew that technology had to support the district, school, and state educational goals as well.

Data in the School Technology Plan detailed the goals and activities for using instructional technology in the school. Each goal listed activities, strategies and techniques that supported the integration of the technology in the school in a way that involved all aspects of the school, so that its use became a seamless and a standard practice in the daily operation of the school. Technology became the driving force that improved the school climate and culture and the students' success in school, college, life, and careers. The school used several technological devices and placed the devices throughout the school to carry out or support the goals.

Archival records presented in Table 5 the Types, Quantity, and Location of Technological Devices, display a list of the type, quantity, and location of the devices found at CPHS. The school staff referred to all the devices as instructional technology and acquired them through multiple years. The use of instructional technology became a standard practice at CPHS.

Table 5

<i>Type and Quantity of Technological Devices and Location</i>		
Variables	N	Location
Type of technological device		
Desktop computer	180	Classroom, computer labs, media center and mobile lab (bus)
Laptop computer	60	Classrooms
Servers	3	Media Center
Promethean boards	50	Classrooms, computer labs and bus
Notebooks	24	Media center
Data projectors	46	Classrooms and Media Center
Student response system (CPS)	46	Classrooms and computer labs
Digital cameras	8	Media Center and Vocational Classroom
Digital video security cameras	30	Inside and outside the school
Inactive slates	46	Classrooms

IPad	25	Media Center
iPod	46	Media Center
Game consoles	1	Media Center and Special Education Department
Graphing calculators	100	Media Center and Math Department
Digital Plotters	1	Career Technology Lab
e-Readers	6	Media Center
Printers	180	Classroom computer labs and bus
Copiers/Fax machines	8	Administrative Offices
Flight simulators	2	Aerospace Department
Smart TV	4	Media Center
Smart cards (lunch, check in)	400	All Students
Digital Signs	2	Inside (cafeteria) and Outside the school

As shown in Table 5 Type, Quantity, and Location of Technological Devices, CPHS had invested of the most popular and up to date technological devices to accommodate the needs of the students, parents, community, and staff. In addition, CPHS had a school bus, which converted to a mobile lab, equipped with computers, and software applications to support the families in the community that needed access to computers or the internet.

CPHS placed the devices in various locations inside and outside the school where the technological devices were visible, accessible, and convenient for use without having to wait. The school employed the use of instructional technology in the daily routine of the school and continuously modeled the use of technology in real life situations. In doing so, the staff became more efficient at addressing the needs of the school, students, parents, and community.

## Theme 2: Purposeful Use of Instructional Technology

During the interview, the SHA acknowledged that the process of incorporating instructional technology led to technology becoming a standard practice and supported the operation of the school and student's success. The SHA said, "The school had

acquired various software applications and programs and used them to carry out specific task”. CPHS staff believed that having a purposeful use for technology was important to the success of the students and school.

School archival records shown in Table 6 Software Acquired and Utilized at CPHS, display a list of the most common software and computer application programs found at CPHS and their primary usages.

Table 6

*Software Acquired and Utilized at CPHS*

Software	Utilization
Infinite campus	Administrative
Online assessment system	Administrative
Print shop ensemble III	Administrative, Instructional, Productivity
Microsoft word suite	Administration, Instructional
Galileo	Instructional
High school graduation	Instructional
Follett circulation and catalog	Managerial
Storybook weaver deluxe	Instructional, Productivity
Dreamweaver 8	Instructional, Productivity
Fireworks	Instructional
Odyssey ware	Instructional
Camtasia studio 7	Instructional, Productivity
Micro type multimedia	Instructional, Managerial
eInstruction	Instructional
Security software	Managerial
Etrieve	Managerial
Microsoft office suite	Administrative, Instructional, Managerial
Class Works	Administrative, Instructional
Internet explorer	Administrative, Instructional
Mozilla Firefox	Administrative, Instructional
Google chrome	Administrative, Instructional
PD360	Administrative, Instructional
Windows photo story	Instructional, Productivity
Window live movie maker	Administrative, Productivity
Check pro	Managerial
Data analysis software	Instructional
Flight simulator software	Instructional
Telemedicine	Administrative, Managerial
Abode acrobat X pro	Administrative, Instructional
Audacity	Instructional
Team Viewer 8	Administrative
Active Inspire	Instructional
3 D Builder	Instructional, Productivity
Edmodo	Instructional
Check In	Administrative, Managerial

As shown in Table 6 Software Acquired and Utilization, CPHS acquired several software and computer application programs to compliment the technological devices and used them to support the managerial task, administrative task, instructional practices of the teachers and the productivity of the students.

During the interview, the SHA elaborated on how using instructional technology had improved the way the administrators managed the school. She explained that using technology provided a “safe and comfortable environment” for the students and staff.

The SHA stated:

“Security software, attendance software, and digital cameras were used to monitor, the school premises, classrooms, and students entering and exiting the building. Telemedicine software monitored the health of students who became ill and the medical needs of special needs students (SHA, personal communication, December 10, 2015).

The use of instructional technology provided the staff, students’ parents, and the community with additional ways to collaborate and communicate. CPHS staff used computer software programs and applications and generated newsletters, documents, multimedia presentations, emails, and text messages. CPHS staff conducted video conferences, made telephone calls using auto attendant, conducted voice over internet (VOIP) phone calls, and networked with others.

The SHA further elaborated on how the use of instructional technology subsidized the need to hire teachers to teach courses not offered at the school and increased the teachers, students and the staff knowledge of technology. She commented, “With the support of technology CPHS ensured that accurate records were kept and reported at the district level.”

Data from school documents showed that instructional technology allowed the school administrators to access and disaggregate data on the school and students’ performance. CPHS faculty used the data and identified areas of strength and areas of weakness. CPHS administrators used instructional technology to expand the school curriculum. In addition, CPHS staff trained teachers on state and federal standards concerning technology integration within the classroom. CPHS staff believed that having a purposeful use for instructional technology allowed a relatively isolated rural high school with few resources the ability to afford their students with an education just as good as or better than most rural and non-rural schools.

During the interview, the SHA provided an explanation about the use of instructional technology for teaching and learning. The SHA responded, “the acquisition of research-based software enhanced the instructional strategies used by teachers and improved the students’ academic performance in class and on test”.

Data found in the school documents showed that instructional technologies were integrated in the school curriculum and aligned to the core common performance standards and state performance standards. The teachers developed and carried out

instructional techniques in the classroom that engaged students in project based, and interdisciplinary activities for new learning, remediation, and enrichment in all subject areas. The student's ability to think critically, reason with others, produced quality work, and to collaborate and communicate with others improved.

Data from archival records found in the Governor Office of Student Achievement (GOSA), School Accountability Reports, in Table 7, displays the Proficiency Level Learners by Percentages the students at CPHS performance on the end of the course test in eight core academic subjects for the 2015-2016 school year. The exams measured the students' performance in the areas of English, math, science, and history.

Table 7						
Variables	Proficiency Level Learners by Percentages 2015-2016			2014-2015		
	# Test	# PLL	% PLL	# Test	#P LL	% PLL
<b>English</b>						
9 <sup>th</sup> Grade Lit/Comp	100	29	29.0%	95	18	18.9%
American/Lit/Comp	59	14	23.7%	87	28	32.2%
<b>Total</b>	<b>159</b>	<b>43</b>	<b>52.7%</b>	<b>182</b>	<b>46</b>	<b>51.1%</b>
<b>Math</b>						
Coordinate Algebra	102	32	31.4%	81	14	17.2%
Analytic Geometry	74	7	9.5%	84	30	35.7%
<b>Total</b>	<b>176</b>	<b>39</b>	<b>4.09%</b>	<b>165</b>	<b>44</b>	<b>52.9%</b>
<b>Science</b>						
Biology	71	8	11.3%	81	28	34.6%
Physical Science	101	26	25.3%	92	36	39.1%
<b>Total</b>	<b>171</b>	<b>34</b>	<b>52.7%</b>	<b>173</b>	<b>64</b>	<b>73.7%</b>
<b>Social Studies</b>						
Economics	81	21	25.9%	56	13	23.2%
US History	91	17	18.9%	87	21	24.1%
<b>Total</b>	<b>172</b>	<b>38</b>	<b>44.8%</b>	<b>143</b>	<b>34</b>	<b>47.3%</b>

Note: Proficient level in all areas defined as scores ranging from 80-91. State Department of Education, 2015

As shown in Table 7 Proficient Level Learners by Percentages, over the past two years, CPHS had experienced an improvement in the number of students scoring at the proficiency level on the end of course (EOC) exam. Earning a proficiency level score meant the student had scored between eighty and ninety-one, demonstrated the knowledge and skills necessary in the grade level course and were prepared for the next grade level or course.

Findings from data indicated the majority of the students' improved their performance on state mandated assessments, were promoted to the next grade level and experienced how it felt to be academically successful in school.

The SHA commented, that often students in isolated rural high schools did not like coming to school because they had not experienced success in their classes. She further stated, "Many of the students living and attending school in isolated rural areas were not confident that they could learn." The students' would "give up" because they did not believe they would pass their classes or go to the next grade. She proclaimed, that being able to pass their classes "validated that coming to school was worth the effort" and would lead to earning a high school diploma.

The State Department of Education, School Accountability Report, as shown Table 8, represented a three-year trend of the attendance of the students in grades 9-12. The students' attendance was divided by days absent: 5 or less days, six to fifteen days, and more than fifteen days. The data displays the school term, a total of all the students enrolled in the school in grades 9-12 and a percentage representing absences.

Table 8

*Three Year Trend of Students Attendance by Percentages*

Year	N	<u>5 or less days</u>	<u>6 to 15 days</u>	<u>More than 15 days</u>
2015-2016	406	70.0 %	23.2 %	6.9%
2014-2015	405	59.3%	31.8 %	9.1 %
2013-2014	392	47.2 %	42.6%	10.2 %

As shown in Table 8, the Three Year Trend in Attendance by Percentages, for the past three years, the school experienced an improvement in the students' attendance. During the 2015-2016 school year, based on an enrollment of 392 students, only 42 (10.2%) were absent 15 days or more from school, 185 (47.2%) of the students were absent 5 days or less from school. During the 2014-2015 school year, based on an enrollment of 405 students, only 37 (9.1 %) were absent 15 days or more from school, 216 (53.3%) of the students were absent 5 days or less from school. During the 2013-2014 school year, based on an enrollment of 406 students, only 28 (6.9%) were absent 15 days or more from school, 284 (70.0%) of the students were absent 5 days or less from school. The percent of students absent from school 15 days or more had declined, and the number of students absent 5 days or less per year had increased. Finding suggested that the used of instructional technology provided the resources that made learning relevant and enabled the students' to experience success, which gave them a reason to attend school.

During the interview, the SHA elaborated on the use of instructional technology supported the productivity of students. When responding, the SHA said, "Increasing the productivity of the students was vital to the success of the school." The SHA believed

that in isolated rural areas to change the mindsets of the students and their parents, the school needed to engage students in learning skills that were relevant to life and enable them to experience the benefits of learning before they finished high school. The uses of instructional technology in the classroom prepared the students with the skills needed to create materials, produced and sell products, and apply what they learned to real life situations in the community and at school. CPHS faculty felted that preparing students' with the skills needed to enter the work force before they left school and for life in a digital world motivated and inspired the students to finish high school.

The State Department of Education, School Accountability Report shown in Table 9, displayed a three-year comparison of CPHS Graduation Rate and the average graduation rate of the state by percentages.

Table 9

*Three - Year Comparison of CPHS Graduation Rate by Percentages*

Variable	CPHS	State
Year		
2015-2016	88.0 %	79.4%
2014-2015	78. 7 %	78.8 %
2013-2014	82.6 %	72.8 %

As shown in Table 9 Three-year Comparison of CPHS Graduation Rate to the State Graduation Rate, over the past three years the school experienced an increase in the number of students completing all the requirements needed to graduate. On an average,

over the past three years, 83% of the students enrolled in the school graduated, whereas, over the past three years, the state average was 77%. Each year CPHS graduation rate had exceeded the states' with the exception of 2014-2015 where the graduation rate was the same as the state graduation rate.

Data from school documents showed that the students were taking more than the required courses needed to graduate in a subject area. Instructional technology allowed CPHS to increase their course offerings and provided alternative ways to deliver instruction. CPHS staff had established a way to satisfy the students' preferences for courses, and course delivery. Many of the students selected advance and accelerated courses.

Findings of data in archival records such as the State Department of Education, School Accountability Report, shown in Table 10, displayed the number of students in grade twelve, the number who graduated, and the percent of students who earned credits for accelerated courses while attending high school.

Table 10

*Three Year Trend of Graduates Earning Credit for Accelerated Courses*

Variable	# in Grade 12	# Graduate	%
Year			
2015-2016	87	85	48.2 %
2014-2015	75	59	58.3%
2013-2014	86	71	63.3%

As shown in Table 10, Three Year Trend of Graduates Earning Credit for Accelerated Courses indicated that the school experienced an improvement in the number of students enrolled in and earned credits for accelerated courses. On an average of 57 % of the students that graduated from CPHS had taken and earned credit for accelerated courses. In the year of 2016, forty-eight percent of the graduates had earned credit for accelerated courses, in 2015, fifty-eight percent of the graduates, and in the year of 2014, sixty-three percent had earned credit for accelerated courses.

The SHA implied, “taking advance and accelerated courses in high school prepared the students for college and additional opportunities for learning.” The SHA felted that the use of instructional technology had equipped the students with the skills needed to collaborate with others, conduct research and explore or reinforce concepts or skills taught in class. CPHS staff had prepared the students for learning at the post-secondary level.

The State Department of Education, School Accountability Report, as shown in Table 11, displayed the number of CPHS graduates and the percent of students who more than likely did not require remediation or learning support when entering college as a freshman.

Table 11

*Three Year Trend of College Ready Graduates by Percentage*

Year	# of Graduates	% College Ready
2016	85	41.1%
2015	59	51.9 %
2014	71	54.4 %

As shown in Table 11 Three Year Trend College Ready Graduates by Percentage, indicated that over the past three years the school had experienced gains in the number of students' that were academically prepared to enter college when they graduated. On an average 49 % of the students that graduated were academically prepared to enter college. In the year of 2016, forty-one percent of the graduates were academically prepared for college, in 2015, fifty-two percent and in 2014, fifty-four percent of the students that graduated from CPHS were academically prepared to enter college. Findings indicated that the majority of CPHS graduates are academically prepared to attend college and had a good chance of being academically successful in college classes.

It was reveal, that CPHS staff was gratified to know that students had taken advantage of the options presented for taking and passing accelerated courses. The actions of CPHS students showed that they were confident in their ability to learn motivated and inspired to be successful in life.

Archival records from the State Department of Education, School Accountability Report, Table 12, displayed the number of students earning credentials such as certificates, and degrees for employment or careers before they graduated from high school. These students were enroll in their third and fourth year of high school.

Table 12

<i>Students Earning Credentials Prior to Graduation</i>			
Variables	Certificate	AA Degree	
Year	CNA	Accounting	General Studies
2015	6	17	-
2016	5	-	29

As shown in Table 12, Number of CPHS Students Earning Credentials Prior to Graduation indicated that CPHS students had graduated from school with the credentials to work, advance in college or careers. During the past two years, CPHS made remarkable progress at helping students earned the credentials to enter the workforce or participate in other educational opportunities leading to careers while enrolled in high school.

During the year of 2015, seventeen dual- enrolled students graduated and earned an Associate Degree in Accounting, and during the year of 2016, twenty-nine dual enrolled students earned an Associate Degree in General Studies. In the year of 2016, six students completed the coursework and state examination to become certified nursing assistants (CNA) and during the year of 2015, five students did the same.

CPHS staff had found a way and promoted the achievement of the students in school, college, life, and careers. CPHS faculty believed that the students, parents and the community realized how rewarding, it was to finish high school with skills that led to success in life, college, and careers.

Data from school documents mentioned how using instructional technology had enhanced teaching and learning. CPHS students were more proficient at learning, and earned the opportunity to experience learning in an environment other than high school. Students who thought they would “never attend college” had the opportunity to attend.

Data in archival records from the State Department of Education, School Accountability Report shown in Table 13 displayed the number of graduates and the percent of graduates from CPHS eligible for the HOPE (Helping Outstanding Pupils Educationally) scholarship during the past three years.

Table 13

*Percentage of Students Eligible for HOPE Scholarship*

Variable	# of Graduates	# HOPE eligible	% Eligible	As
School Year				
2015-2016	85	23	27.1%	Table 13
2014-2015	61	12	19.7%	
2013-2014	71	14	19.7%	

Students by Percentages over the past three years, the school saw progress in the number of students that graduated who were eligible for financial assistance if they entered college in the state. On the average 22% of the students that graduated from CPHS met all requirements, and were eligible for the HOPE scholarship. In the school year of 2016-15, of the 85 students that graduated, 23 (27%) were eligible for the HOPE scholarship. In the school year of 2014-15, of the 65 students that graduated 12 (20%) were eligible for the HOPE scholarship and in the year of 20-13-2014, of the 71 students that graduated, 14 (19%) were eligible for the HOPE scholarship.

Findings indicated the incorporation of instructional technology in an isolated rural high school provided the resources needed, promoted students' success and helped them obtained additional resources to supplement further learning at a post-secondary institution.

### Theme 3: Outcomes of Using Instructional Technology

When asked about the outcome of using technology, CPHS faculty felt that the effect of using instructional technology in this isolated rural school had yielded promising results.

Documents from CPHS showed that data existed that confirmed the school had progressed and met state accountability measures. CPHS staff believed the school benefitted from using instructional technology and the students had made good progress, not only while in school but after finishing school as well.

The State Department of Education, School Accountability Report, shown in Table 14, displayed a three-year trend of the number of graduates and the percentage of graduates' outcome for the past three years.

Table 14

<i>Three Year Trend of Graduates Outcome by Percentage</i>						
Class Year	2015		2014		2013	
Variables	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Graduates (reported)	61		71		53	
Post-Secondary						
Public		28.0		58.0		47.0
Private		5.0		-		2.0
Technical		16.0		15.0		8.0
Working		13.0		10.0		11.0
Unknown		31.0		13.0		26.0

Note: These data come from either the Georgia Independent College Association (GICA) or the National Student Clearinghouse (NSC) and reported to the State Department of Education, 2015.

As shown in Table 14 Three Year Trend of CPHS Graduating Class Outcome by Percentage, revealed that more of the school graduates entered a college or obtained a

job. A breakdown of the outcomes of the reported number of graduates that enrolled in a college or had a job shows that in 2015 of the 61 graduates reported, 28% entered a public college in the state, 5% a private college in the state and 16% a technical college in the state. Thirteen percent entered the workforce. In 2014, out of the 71 graduates reported 58% entered a public college in the state, and 15% entered a technical college in the state. Thirteen percent entered the workforce. In 2013, out of the 53 graduates reported, 47% entered a public college, 2% a private college, and 8% a technical college in the state. Eleven percent entered the workforce.

CPHS staff evaluated the incorporating of instructional technology in the school and believed based on the students and school performance on state measures it was beneficial. Each year the State Department of Education rated the schools in the state and determined whether they were on the right path to school improvement. Each school in the state received a 1-5 star rating, a five star represented an excellent school climate, and a one star represented a school climate that needed improvement. Documents from the the state accountability reported showed that the school atmosphere and culture had improved and the perception of the school had improved.

The State Department of Education, School Accountability Report shown in Table 15, displayed the school climate star rating score for the past three years.

Table 15

Three Year Trend of School Climate Star Rating

Year	Score	Star Rating
2015- 2016	74.0	3
2014- 2015	82.6	4

2013- 2014

76.3

4

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 Note: Scores and ratings  $\geq 87.6$  (5),  $\geq 81.0$  (4),  $\geq 74.4$  (3),  $\geq 67.8$  (2),  $\leq 67.8$  (1)
 

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As reported in Table 15, Three Year Trend of School Star Climate Rating Scores indicated that over the past three years CPHS had received positive star ratings. The school received a star rating of four for two consecutive years, and a star rating of three, during the 2015-2016 school year. On the average, the school had maintained a rating of four, which suggested that the students, teachers, parents, and community perception of the school was good, the students' behavior was good and the attendance of the teachers, students, administrators, and the staff was good.

Documents disclosed that the CPHS had seen improvements on standardized test scores, student growth on test, graduation rates, and college readiness. Compared to the state CPHS performance exceeded or was equal to the progress made by most public schools in the state.

Data in archival records from the State Department of Education, School Accountability Report shown in Table 16, provides information on the Overall School Performance Scores over the past three years.

Table 16

<i>Comparison of School Overall Performance Score</i>				
Year	CPHS Performance Score		State Overall Performance Score	
	Letter Grade	# Grade	Letter Grade	# Grade
2015-2016	C	74.0	C	75.7
2014-2015	B	82.6	C	75.5

2013-2014	C	76.3	C	72.3
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**Note:** Grade conversion scale: A (90-100), B (80-89.9), C (70-79.9), D (60-69.9) F (0-59.9); Alpha grades are Defined as: A= excellent, B = good, C = average, D = fair and F = need improvement.

Table 16, shows a Comparison of School Overall Performance Rating scores to the state. During the 2014-2015, the highest rating score CPHS received was a B, and the state highest rating score was a C. During the other years, both CPHS and the state received scores of C's. Therefore, CPHS overall school performance scores in comparison to the state overall school performance scores were equal to or exceeded the mean performance score of the state.

CPHS staff believed the process of implementing instructional technology in the school with purposeful goals designed to improve the operation of the school and student achievement led to improvements. The SHA commented that CPHS had provided the students attending with a quality education just as “good as or better than most schools, rural and non-rural.”

The State Department of Education, School Accountability Report, shown in Table 17, displayed a current snapshot of CPHS performance on three key measures in comparison to all public schools in the state and schools in the same districts.

Table 17

<i>Snapshot of CPHS Performance in Comparison to State and District</i>		
Variables	% Higher than State	District
Measures		
School Overall Performance	52 %	Higher
Student's Academic Growth	46 %	Similar

Four Year Graduation Cohort Rate	46 %	Lower
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As shown in Table 17 a Snapshot of CPHS Performance in Comparison to State and District that rated the school on three key measures: the overall performance of the school, student academic achievement and the four-year cohort graduation rate. Findings indicated that CPHS overall performance was higher than 52% of schools in the state, and was higher than the schools in its district. The students' academic growth was higher than 46% of schools in the state and similar to its district. The school's four-year graduation rate was higher than 64% of high schools in the state and lower than its district. CPHS had performed just as well as or better than most schools in the state and schools in its districts. CPHS staff made great strides with the use of instructional technology in their efforts to improve the school and support student achievement. With the support of instructional technology, not only did these efforts lead to success for most students, the efforts paid off for the school and community as well.

#### Theme 4: Resource Requirements

During the interviews, data were gathered and used to explain how the school maintain the technology and what support was given when issues arises. Finding of data in the interview indicated that CPHS faculty promoted the use of instructional technology. CPHS faculty knew what was required to incorporate instructional technology, the purpose for doing so and how the school and students would benefit. CPHS staff created a five-year plan for technology.

*Budget for the technology.* The School Technology Plan indicated that the practice of using instructional technology at the county high school required a yearly budget that included staffing, software updates, technology replacements, maintenance, facilities, and space and professional development. The school allotted money for technology each year for 5 years. In addition, the school applied for e rate funds, technology grants and free digital resources.

*Staffing for the technology.* The School Improvement Plan and School Technology Plan showed that staff members, administrators, teachers, and support personnel were assigned various duties and responsibilities for the incorporation of technology. The Site Head Administrator (SHA) was responsible for the total implementation of instructional technology. The Director of CTAE was responsible for the incorporation of instructional technology into the curriculum in the CTAE (career technology agricultural education) area of study. The assistant administrators monitored the progress of the use of instructional technology in the school. The technology specialist made sure the technology worked for everybody in the school, set up the sharing of group folders, ensured the Internet was accessible and everybody had an e-mail account. The media specialist made sure permissions were obtain from students to use the internet, made sure the technology worked for the teachers, helped the teachers understand how to use the technology in the classroom and find resources. The school nurse used instructional technology to access the state immunization system, and attended to the medical needs of the students using the telemedicine software.

**Mitchell County High School Layout with Teachers' Rooms**

Legend:

- Main Entrances to School
- Media Center
- Gym
- Cafeteria
- Main Halls
- Walkways
- Courtyard
- Offices

Key areas and rooms include:

- Classrooms:** F236 Graphic Design, F241 Video Classroom, F249 Video Production, F284 Healthcare Science, F271 Cosmetology, F209, F217, F218, F221, F219, F216, F215, F214, F213, F212, F211, F210, F209, F208, F207, F206, F205, F204, F203, F202, F201, F200, F199, F198, F197, F196, F195, F194, F193, F192, F191, F190, F189, F188, F187, F186, F185, F184, F183, F182, F181, F180, F179, F178, F177, F176, F175, F174, F173, F172, F171, F170, F169, F168, F167, F166, F165, F164, F163, F162, F161, F160, F159, F158, F157, F156, F155, F154, F153, F152, F151, F150, F149, F148, F147, F146, F145, F144, F143, F142, F141, F140, F139, F138, F137, F136, F135, F134, F133, F132, F131, F130, F129, F128, F127, F126, F125, F124, F123, F122, F121, F120, F119, F118, F117, F116, F115, F114, F113, F112, F111, F110, F109, F108, F107, F106, F105, F104, F103, F102, F101, F100, F99, F98, F97, F96, F95, F94, F93, F92, F91, F90, F89, F88, F87, F86, F85, F84, F83, F82, F81, F80, F79, F78, F77, F76, F75, F74, F73, F72, F71, F70, F69, F68, F67, F66, F65, F64, F63, F62, F61, F60, F59, F58, F57, F56, F55, F54, F53, F52, F51, F50, F49, F48, F47, F46, F45, F44, F43, F42, F41, F40, F39, F38, F37, F36, F35, F34, F33, F32, F31, F30, F29, F28, F27, F26, F25, F24, F23, F22, F21, F20, F19, F18, F17, F16, F15, F14, F13, F12, F11, F10, F9, F8, F7, F6, F5, F4, F3, F2, F1, F0.
- Labs:** 500 Agriculture, Lab, Lab.
- Administrative:** Principal's office, Guidance, Principal, Main Offices, Main Office-9th grade, Office.
- Support Spaces:** Storage, restroom, Telemedicine, F271 Cosmetology, F209, F217, F218, F221, F219, F216, F215, F214, F213, F212, F211, F210, F209, F208, F207, F206, F205, F204, F203, F202, F201, F200, F199, F198, F197, F196, F195, F194, F193, F192, F191, F190, F189, F188, F187, F186, F185, F184, F183, F182, F181, F180, F179, F178, F177, F176, F175, F174, F173, F172, F171, F170, F169, F168, F167, F166, F165, F164, F163, F162, F161, F160, F159, F158, F157, F156, F155, F154, F153, F152, F151, F150, F149, F148, F147, F146, F145, F144, F143, F142, F141, F140, F139, F138, F137, F136, F135, F134, F133, F132, F131, F130, F129, F128, F127, F126, F125, F124, F123, F122, F121, F120, F119, F118, F117, F116, F115, F114, F113, F112, F111, F110, F109, F108, F107, F106, F105, F104, F103, F102, F101, F100, F99, F98, F97, F96, F95, F94, F93, F92, F91, F90, F89, F88, F87, F86, F85, F84, F83, F82, F81, F80, F79, F78, F77, F76, F75, F74, F73, F72, F71, F70, F69, F68, F67, F66, F65, F64, F63, F62, F61, F60, F59, F58, F57, F56, F55, F54, F53, F52, F51, F50, F49, F48, F47, F46, F45, F44, F43, F42, F41, F40, F39, F38, F37, F36, F35, F34, F33, F32, F31, F30, F29, F28, F27, F26, F25, F24, F23, F22, F21, F20, F19, F18, F17, F16, F15, F14, F13, F12, F11, F10, F9, F8, F7, F6, F5, F4, F3, F2, F1, F0.
- Recreation:** Cafeteria, Gym, GYM.
- Other:** Early Childhood and Pre-K, Pre-K Kitchen, E128 Culinary Arts restaurant, patio, E1116a, E1116, E117, Teachers' Lounge, Courtyard, Band, Main Entry, Mobile 19, Mobile 10, Mobile 29, Mobile 20, C118, C117, C116, C115, C114, C113, C112, C111, C110, C109, C108, C107, C106, C105, C104, C103, C102, C101, C100, C99, C98, C97, C96, C95, C94, C93, C92, C91, C90, C89, C88, C87, C86, C85, C84, C83, C82, C81, C80, C79, C78, C77, C76, C75, C74, C73, C72, C71, C70, C69, C68, C67, C66, C65, C64, C63, C62, C61, C60, C59, C58, C57, C56, C55, C54, C53, C52, C51, C50, C49, C48, C47, C46, C45, C44, C43, C42, C41, C40, C39, C38, C37, C36, C35, C34, C33, C32, C31, C30, C29, C28, C27, C26, C25, C24, C23, C22, C21, C20, C19, C18, C17, C16, C15, C14, C13, C12, C11, C10, C9, C8, C7, C6, C5, C4, C3, C2, C1, C0.

As illustrated in Figure 2, Layout of CPHS, the design of CPHS showed that the school facilities were designed for the use of instructional technology. CPHS had enough space for the technological devices. The facilities accommodated groups or individuals engaged in the use of instructional technology for conducting the school business,

teaching, and learning, and the production and selling of marketable products and services.

*Professional Development.* Data found in School memos indicated that CPHS district and school staff offered professional development activities on using instructional technology. Every teacher attended professional development activities on every Tuesday and other occasions. The Director of Special Education provided professional development on the use computer applications to develop IEP's (individualized educational plan) for students with disabilities. The District Migrant Education staff provided professional development on migrant programs and online assessments. The Media Specialist developed and delivered presentations on how to use technological devices, specific software, computer application programs, and search for resources. The District Curriculum Director and staff provided professional development on the use of the student data system, and online professional development programs and online assessment.

Data found in school documents indicated that CPHS faculty continuously updated the computers, the software, and the internet connectivity. The staff received training on how to use and integrate the instructional technologies in the school, labs, and classrooms. The professional development activities allowed CPHS staff with the training and resources needed to support and enhanced the operation of the school, instructional practices of the teachers and overall performance of the students.

This section of Chapter IV provided a summary of the findings and an explanation and discussion of the findings based on the two research questions that guided the study.

1. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school?
2. To what extent does the use of technology in isolated rural high school impact students' achievement?

### Summary of Findings

The summary of the findings are reported by the two research questions that guided the study.

#### Summary of Findings Research Question One

1. Using instructional technology transformed the way the school operated and the school environment, which led to a positive school climate and perception of the school.
2. Using instructional technology led to the school becoming more efficient and effective in their educational practices.

#### Summary of Findings Research Question Two

1. Using instructional technology to enhanced the instructional practices of the school led to more productive teaching and learning.

2. Using instructional technology to provide additional ways for students to learn, led to an increase in students' achievement.
3. Using instructional technology for teaching and learning enhanced the educational opportunities of the students, and the overall performance of the school.

## Explanation and Discussion of Findings

The researcher provided an explanation and discussion of the results by addressing the two questions that guide the study.

### Explanation and Discussion of Research Question One Findings

Research question one sought to explain the extent to which the use of technology in a relatively isolated rural high school with limited resources influence the operation of the school.

Administrators' of isolated rural high school in an effort to provide a quality education encounter issues with funding, teacher recruitment and retention, parent, and community support, motivation and technology which may hinder their efforts to provide a quality education. These finding support prior research by Strangle (2009) and Preston, Jakubiec and Kooymans (2013) reported that rural school administrators' face challenges that influenced the operation of the school and impacted student achievement.

Redding & Walberg (2012) and Strange and Johnson (2012) suggested that isolated rural areas without adequate resources to support the income, health, welfare, safety, and education of the people were impacted by the lifestyle, thinking and attitude of the

population's about education. This in turn, influenced their children attitude and behaviors at school and because of students' needs to be motivated. In this study, 98% of the students' attending CPHS were; economically disadvantaged and eligible free or reduce meals and special programs. The students did not come to school regularly and did only the minimum required to pass. The socioeconomic status of the community and families was low and the educational attainment level of the majority of the resident was low. The parents did not participate in their child's education or support the school. These findings were consistent with the work of Redding and Walberg (2012), and Strange and Johnson (2012) who reported that the lack of the ability of the parents of rural high school students to support the needs of the families, contributed to the students' attitude, behavior, and their feelings about school and learning.

In addition, Howley (2002) found that the inability of remote rural areas to develop and grow had a profound effect on the populations' culture and traditions as well as their aspirations in life. Many of the students lacked proper health care, and nutrition; they lacked socialization skills, motivation, parental support, and hope. Howley (2002) suggested that the culture and tradition of the family of students attending isolated rural high schools, often led to the students' and their parents showing little interest in education and not understanding the value of education and lack of aspiration.

Hardré and Hennessey (2010) suggested students attending rural public high school, self-perceptions, family perceptions, and environmental perceptions influenced their engagement, expectations, and achievement in school. In another study Woolfork

(2012), literature on the psychology of learning posited that for learning to occur; the student must be motivated to learn, believe they can learn and understand the value of education and learning. However, students who are deprived of the basic necessities of life may not feel good about themselves because of their family' lifestyle or lack of personal resources and need support and encouragement. The students attending CPHS had a low perception of the school and exhibited a lack of self-esteem, and did not believe they could be successful in college or school. These findings are consistent with the work of Hardré and Hennessey (2010) and Woolfork (2012), that often support and encouragement was needed to inspire students to learn and engage in learning and when students were motivated, to believe that they could learn and see the benefits of learning, they were more than likely take the necessary steps to achieve.

Bell and Pirtle (2012) suggested that changing the perception and behavior of remote rural high school students required the involvement of the community, parents, students, and staff in all aspects of the school. Evidence of findings in this study suggested that, using instructional technology in a way that, involved everyone one in all aspects of the school led to an improved the educational practices of the school. The parents and the community showed an interest in the school. The staff and student were motivated to come to school and participate in teaching and learning. These findings are consistent with the work of Bell and Pirtle (2012) that involving everyone in all aspects of the school could lead to an improvement in the performance of the school and the

behavior of the staff, students and parents and community in the school and the perception of the school.

The findings from this study supported the work of Hardré, Sullivan and Crowson (2009) literature about the physical appearance of the school and motivation of students being affected by the physical features of the school. When the daily routine of the school, students, and the activities the school is engaging, this influences the student's desire to attend school and participate in learning. This suggests instructional technology enhanced the physical appearance of the school and supported the personal and social needs of the students, parents, and community. In addition, the use of instructional technology changed the climate of the school, the daily routine of the staff, students, and teachers, and the events that occurred at the school. These findings supported the work of Hardré, Sullivan and Crowson (2009) that using instructional technology in a way that addressed the characteristics of the student's and the way the school operated motivated students to come to school, participate in learning, and take advantage of other opportunities to learn.

In addition, Pitler, Hubbell and Kuhn (2012) research on the use of technology in education found that utilizing technology had the potential to be effective, alleviate or diminish most challenges faced by the school and provided opportunities for students to experience learning in different ways. Instructional technology was effective at motivating students to come to school and participate in learning, be successful at learning, showed them the benefits of learning and provided them with other

opportunities to learn. Prior research of Pitler, Hubbell and Kuhn (2012) showed that using instructional technology in conducting school can be effective and alleviate most challenges encountered by the school and provide other opportunities for learning.

The incorporation of instructional technology into the administrative and management practices of the school led to improvements in the way the school conduct business. The use of instructional technology enhanced the efficiency, and effectiveness of the school educational practices, perceptions of the school, the students' willingness to come to school, and the performance of the students and the parents and the community interest in the school. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school? The use of instructional technology in this isolated rural school suggested instructional technology had a positive influence on the school, thereby, changing the school culture and climates, hence, making the school supportive and productive.

### Explanation and Discussion Research Question Two Findings

Research question two sought to explain to what extent does technology impact the students' achievement.

Literature by Bakia, Means, Gallagher, Chen, and Jones (2009) on how educational programs are enhanced through technology, found that if technology was used in a way that supported the school efforts to provide students with opportunities and resources to experience learning in a variety of ways, then the students are more than likely to be

successful. This study's finding showed that using instructional technology in this isolated rural high school provided the resources for teachers to deliver instruction in different ways; thereby, increased the opportunity for students to experience success. This supported the work of Bakia, Means, Gallagher, Chen and Jones (2009) who suggested that using instructional technology to enhance the instructional practices of the teachers allowed the teachers to deliver instruction in different ways and students to experience learning in different ways.

Allen and Seaman (2011) found that using technology for teaching and learning allowed remote rural schools to offer students opportunities for learning, that otherwise might not be possible. This study's finding showed that teachers used instructional technology as a resource to support their classroom instruction making learning relevant, modeling learning in real life situations, and applying what was learned in the classroom. The use of instructional technology supported teaching and learning led to teachers being more productive in their instructional practices, thereby, increasing the productivity of the student. These findings are consistent with the work of Allen and Seaman (2011) that using technology for teaching and learning in isolated rural schools afforded students opportunities to learn and be successful that otherwise without technology would not be possible.

The work of Lacour and Tissington (2011) and Farrigan (2012) on isolated rural schools and student achievement found that student achievement was influenced by the availability of resources to students and that the majority of the students living and

attending high school in an isolated rural area were socially and economically deprived. Due to the lack of personal and social resources, many students in this study struggled to be successful at achieving the same level of achievement as students not living in poverty. Some of the factors that affected student achievement included the parent's level of income, source of income, and the parent's education level. In addition, Lacour and Tissington (2011) and Farrigan (2012) pointed that often, students' score below average on assessment measures, and needed assistance to achieve high performance in academics. This study showed the school used instructional technology and supported the students requiring special services or equipment to function academically, provided remediation, offered credit recovery, accommodated the student's preference for learning, and enrichment. The use of instructional technology aligned with instructional strategies in the classroom, led to an improvement in the student's academic performance. These findings are supportive of the work of Lacour and Tissington (2011) and Farrigan (2012) that the influence of the environment, people and community affect the students' achievement in school and that the school must find ways to address the influences so that students can be successful.

In a similar fashion, the work of Tamim, Bernard, Borokhovski, Abrami & Schmid (2011) in an evaluation of the validity of using instructional technologies found that, thoughtfully integrating technology that was relevant to what was being taught heightened the ability of the students to think critically. In this study, teachers incorporated the use of instructional technology in their lessons in a way that allowed

students to participate in learning and find solutions and answers to lessons on their own, which led to an improvement in their academic performance on state exams, thereby, increasing the students' achievement. These findings supported the work of Tamim, Bernard, Borokhovski, Abrami & Schmid (2011) that the integration of technology that was relevant to what was being learned in the classroom, enhanced the student's ability to think critically and apply what they learned to different situations.

Literature by Gruber, Wiley, Broughhman, Strizek and Burian-Fitzgerald (2002) stated that about half of all U.S. high schools do not offer accelerated or advance Placement (AP) courses. The report emphasized that this was particularly true in remote rural areas, where, it was difficult to attract teachers qualified to teach accelerated or AP courses. In this study, the use of instructional technology allowed the school to improve the curriculum, increase course offerings, and participation in accelerated courses and advanced courses. Just as Gruber Wiley, Broughhman, Strizek and Burian-Fitzgerald (2002) reported, without the use of instructional technology CPHS students would not have had the opportunity to take advanced or accelerated courses.

Nagel's (2010) work on the use of technology in schools found that the growth of using technology in K-12 schools had increased, and the public's approval of high school students earning credits in courses delivered using technology for instruction had grown. In this study, instructional technology gave the students at CPHS a positive outlook on life, more students acquired the skills for employment, and credentials for professional careers before they finished school and earned college credits while in high school. In

similar fashion, Gordon (2011) work on learning in a remote area and technology in rural schools pointed out that using the right kind of technology ensured that students in rural areas would get the same quality of educational experiences as their counterparts in urban and suburban neighborhoods. In this study, the school was making remarkable progress in preparing students for success in school, college, and careers and preparing them for life in a changing global economy. These findings were supportive of the works of Nagel (2010) and Gordon (2011) that the use of instructional technology in isolated rural high schools had grown and the right kinds of technology helped the school provide an education just as good as or better than non-rural schools or other rural schools.

The staff at CPHS believed the incorporation of instructional technology was a critical component of the instructional practices in this remote rural district with problems created by the characteristics of the environment. With instructional technology, many of the initiatives in which the schools participated in and the accomplishment made would not have been possible. Therefore, in response to research question two: “to what extent does the use of instructional technology in an isolated rural high school impact student achievement”? It was evident that using instructional technology prepared them for success in school, increased the student academic performance, increased the opportunity to further their education, prepared them for the workforce, prepared them for success in college, enabled them to earn credentials before leaving school, and prepared them with the necessary skills to be successful in life.

## Chapter Summary

Five major findings were noted; (a) the practice of using instructional technology led to a transformation of the school culture and climate, (b.) the practice of using instructional technology led to productive teaching and learning, (c.) the practice of using instructional technology led to an increase in the students' academic achievement, (d.) the practice of using instructional technology led to additional opportunities for learning beyond high school, and (e.) the practice of using instructional technology led to an improvement in the school's overall performance.

## CHAPTER V

### DISCUSSION, CONCLUSION, LIMITATIONS/DELIMITATIONS, IMPLICATIONS, RECOMMENDATION

#### Introduction

This chapter includes a discussion of the findings, conclusion, implication for educational policies and practices and recommendations for further research.

This qualitative single case study design utilized interviews, observations, documents, and archival records to collect data on one remote rural high school in the southern part of the United States. The qualitative case study was guided by two research questions to explain the events taking place at the county public high school (CPHS).

The questions were:

1. Given the relative isolation and limited access to resources faced by rural, isolated high schools, to what extent does the use of technology influence the operation of the school?
2. To what extent does the use of technology in isolated rural high school impact students' achievement?

The purpose of this qualitative case study was to explain the extent to which the use of technology in a relatively isolated rural high school influenced the operation of the school and how the use of technology influenced the success of the students. The goal was to share information with comparable isolated rural high schools with limited resources needing to find ways to make the school more productive in their managerial practices and efficient in their instructional practices in an effort to improve student achievement.

The inauguration of federal government policies assuring all students attending public schools in the United States equal access to a highly qualified education (McMillan, 2012) sparked national attention on improving the performance of rural schools and districts. Rural areas in southern states had the lowest achievement scores, perhaps, due to the influence of the environment, the people, and the community (Farrigan, 2012). The most prevalent reason was the unique characteristics of the locality impeded the educational process in the area (Redding & Walberg, 2012). Ashtron and Duncan (2012) reported that administrators of remote rural high schools encountered issues stemming from the conditions of the environment that inhibited the ability of the school to function adequately. These issues gave rise to problems with funding, recruitment and retention of qualified teachers, community and parent involvement, motivation, technology and student achievement (Preston, Jakubiec & Kooymans, 2013). Consequently, the location of the school was one of the major factors that influenced students' achievement (Lacour & Tissington, 2011).

Given the relative isolation and few resources, remote rural high schools had to initiate reforms based on their circumstances that made them more successful. For administrators of remote rural schools, discovering ways to offer a quality education that was effective and efficient required working within budget constraints. The use of technology for instruction was cost efficient, and had the potential to allow schools the opportunity to offer additional courses, alternative ways to deliver instruction, provide additional resources, ease budget restraints, and improve student achievement (Pitler, Hibbell & Kuhn, 2012). Many remote rural high schools found the use of instructional technology promising (Irvin, Hannum, Banks, Farmer & Keane, 2009). However, most of the research focused on rural schools in general; a gap exists in the literature on the incorporation of instructional technologies to raise pupil achievement in isolated rural high schools.

The organization of an isolated rural high school such as the county public high school (CPHS), incorporated instructional technology to support the operation of the school and success of the student. The school administration, in an attempt to improve the quality of education at CPHS, integrated instructional technology in a way that included everyone with a vital interest in the school.

CPHS administrators understood how the customs, beliefs, and traditions of the community influenced the families' attitude and behavior, thus influencing their children attitude and behavior toward learning. Although CPHS used instructional technology in the past for credit recovery and data collection, the administrator realized that in CPHS,

there was a need to use technology to address the students' attitudes and behaviors toward learning. Therefore, the administrators strategically planned and used instructional technology to support or change the students and their parents' beliefs about education and learning. In doing so, CPHS staff integrated activities using instructional technology into the educational practices of the school in a way that inspired students to learn, and help them understand the value of learning and the benefits of a good education. In CPHS, the use of instructional technology changed the physical structure of the school, the daily operation of the school, and accommodated the personal and social needs of the students and their parents, thereby, making learning relevant and meaningful. This led to a change in the way the school operated, and the students and their parents' mindset about the school, and learning.

The school administrators employed strategies and techniques using instructional technology that supported teaching and learning. The school curriculum was expanded, instructional practices were modified, and the students' preferences for courses were accommodated. In CPHS, the use of instructional technology led to both teachers and students engaging in productive teaching and learning.

Teachers thoroughly integrated instructional technology into their curriculum and instructional practices by aligning the technology and software to the state and local educational standards and goals. Instructional technology replicated real life situations and helped the students make the connection between what the students learned in the classroom. The integration of instructional technology made learning relevant,

meaningful, and applicable to real life situations. Therefore, the practice of using instructional technology at CPHS led to an increase in the students' academic performance, as evidenced in CPHS standardized test scores.

Not only did using instructional technology at CPHS improve the students' academic performance, there were other improvements as well. The practice of using instructional technology in this isolated rural high school led to an increase in the graduation rate, attendance rate, post-secondary education, attainment of support for students pursuing other educational initiatives, and the attainment of credentials for entering the workforce before leaving high school.

In addition, other outcomes were noted in the way CPHS used instructional technology. The perception of the parents, students, teachers, and community improved, the school climate improved, and the attendance of the staff, teachers, and student improved. Overall, the use of instructional technology at CPHS boosted the overall performance of the school, teachers, and students, which led to an improvement in the schools' accountability performance rating.

## Discussion of Research Findings

One in ten students is educated in a remote school district. Many of the school districts are located in the southern part of the United States, and many of the students served are minorities and deprived students. In many instances, the talents and abilities of the students' were more than likely not noticed, when compared to urban and suburban schools (Hill, 2015). Therefore, federal and state educational policymakers implemented

reforms and policies to make sure rural school students' received the same quality of education as non-rural schools (NCLB, 2001). However, Jennings (2012) pointed out that the outcomes of implementing many of the interventions especially in isolated rural high schools were not consistent. Some schools improved, some remained the same, and got worse. This study explained how one isolated rural high school found a way using instructional technology to provide the students with a quality education.

Isolated rural high schools were characterized based on their geographical location, low population density, family isolation, and proximity to an urban or suburban area (Redding & Walberg, 2012). However, it was clear that the attributes of the geographical location, community, and population of an isolated rural high school had a profound influence on the quality of education (Abshier, Harris & Hopson, 2011). This study examined how the characteristics of the geographical area affected the school, population, thus the communities. Findings provided evidence that suggested that the geographical location of the area lacked or had limited services and resources to support the needs of the people. The area lacked jobs and the minority of the families were economically disadvantaged and relied on assistance from the government. In an isolated rural high school, this presented issues for the school and the students attending, especially in an effort to provide a good education and promote students' success.

The geographical location of remote rural areas created barriers for the families, school, and the students, when it came to education. (Strangle 2009). Unfortunately, when the conditions of the area were not favorable, administrators' of isolated rural high

schools were challenged to address issues such as funding, recruitment, and retention of teachers, parent and community involvement in the school, motivation, and technological resources (Preston et al., 2013). The school in this study had encountered most of these issues and set out to find a solution. Doing so was vital to the operation of the school and the success of the students. Therefore, CPHS implemented instructional technology as a solution that proved to be effective and efficient at addressing those barriers.

The characteristics of the geographical location and the population of isolated rural area, in terms of the demographics, along with finances and resources were vital to understanding students' achievement (Luis, Robinson & Detwiler, 2012). The school thoroughly planned and implemented instructional technology in a way that supported the characteristics of the environment, students, and their families. The expectation of using instructional technology was to change the school environment, for everyone to become more proficient at using technology, to change the educational practices of the school and to prepare students for success.

This study provided evidence that showed how the use of instructional technology, at CPHS, not just for academic performance changed the physical appearance of the school, allowed the staff to monitor the safety and health of the students, and exposed the students to different technological devices. Because of their efforts, the use of instructional technology led to the establishment of a safe, healthy, and supportive learning environment, where students and teachers engaged in productive teaching and learning.

In isolated rural high schools, the parents influenced many of the student's attitudes and behavior about school and learning. In many cases, the lack of basic necessities such as food, clothing, and shelter was over shadowed by their educational needs and the support and encouragement of parent was lacking. With this being the case, students often saw, the value of having a good education and their aspirations in life limited to what they were accustomed too. At CPHS, the use of instructional technology allowed the staff to make students feel successful, believe in themselves, and see the benefits of their efforts. Bell and Pirtle (2012) in a study on transforming rural schools suggested that changing remote rural schools required the integration of existing values, norms, and cultures of the community and school. The authors concluded that the community, parents, students, and staff should be included in all phases of the effort to change the school. In this study, CPHS was successful in their effort to help teachers, students, parents, and the community understand the importance of learning, achieving, and the value education, thereby, changing the way the school operated the school environment and the mindset of the students, parents, and community groups about the school and education. At CPHS the teachers, parents, and community groups worked together, the students tended to do better in school and stayed in school longer, liked school more, and believed that education can be beneficial.

The administrator of CPHS realized that just as differences existed between rural schools due to their location, differences existed among the characteristics of the rural high school students' that influenced their overall performance when using

technology for teaching and learning. According to Kim, Chen and Ryder (2008) the students' physical characteristics, social cognitive abilities, and the way they learn influenced the students' behavior toward learning using technology. In similar study, Song & Oh (2011) suggested that the cultural backgrounds of rural school students influenced their preference for learning. In another study, Barbour & Siko (2012) suggested that the lack of access to the internet or computer more or less influenced the students' success when using technology for teaching and learning in isolated rural high schools. To increase the chance of students being successful when using instructional technology for teaching and learning CPHS staff accommodate the cognitive abilities of the students, their preference for learning and made sure the students were confident and trusted using technology for teaching and learning. At CPHS, instructional technology allowed the staff to collect, analyze, monitor, and evaluate data for learning to support teachers and of learning to support students. At CPHS the use of instructional technology allowed the school to offer different courses and deliver instruction in different ways. In addition, CPHS staff used instructional technology to remediate students in core academic course and administered assessments online. At CPHS the students were allowed access to computers and the internet before, during and after school hours to accommodate their academic, social and personal needs. CPHS served predominately, African American, high school age females, who were economically, disadvantaged with limited personal resources. This group of student represented 48% of the academic achievement test scores made on state mandated exams. Although the data in this study

was not analyze to show the difference in terms of age, gender, and ethnicity of isolated rural high school students performance finding suggested that these differences were not a significant factor using instructional technology. CPHS staff accommodated the differences in the student's cognitive abilities and made the necessary adjustments that increased the students' chances of being successful, satisfied the students' preferences for courses and how the courses' were delivered and technology accessibility to students. The results of this study were consistent with the work of Kim, Chen and Ryder (2008) that the students' cognitive abilities influenced the students' behavior toward learning using technology and Song and Oh (2011) that isolated rural high school students' preferences for learning impacted their success in school. In addition, the findings supported the work of Barbour & Siko (2012) who suggested the accessibility of technology influenced the students' performance when using instructional technology for teaching and learning in an isolated rural high school.

The incorporation of instructional technology into the instructional practices of the teachers allowed the teachers to teach course content in a variety of ways. In CPHS teachers accommodate learning by offering students ways to engage in instruction that made them believe, they could learn and experience success. At CPHS, courses were offered, face-to-face with a teacher, online with or without a teacher or a combination of both. According to Cavanaugh (2001), the delivery method was not significant in improving student achievement, but the instructional methods and preferences for learning were more significant. At CPHS, the instructional practice of the teachers

included the use of instructional technology and software that was relevant to classroom instruction and replicated real life situations such as modernized farming, a medical clinic, restaurant, graphic art shop, radio station, production studio, and beauty salon. In addition, teachers required students to participate in performance-based activities, cooperative learning, group and individualized instruction activities. CPHS used instructional technology in their instructional practices to teach course content in a variety of ways. Doing so supported the work of Cavanaugh (2001) who suggested the delivery method did not play a significant role in improving student achievement; instead the methods of instruction used in delivering the course and the students' preference for how they wanted to learn, more than likely influences student achievement.

Tamim, Bernard, Borokhovski, Abrami and Schmidt (2011) in a meta-analysis and validation study on the impact of technology in education on student achievement suggested that instructional technologies improved student achievement, if the technology was integrated into teaching and learning in a way that was relevant to what was being taught. At CPHS, instructional technology was integrated into the curriculum and instructional practices to enhance the student's ability to think critically, help them make the connection between subjects' content and real life experiences and apply what was learned to real life situation. AT CPHS, the teachers integrated and aligned the instructional technology and computer software into their teaching strategies. The teaching strategies consisted of integrating instructional technology into their oral and written lessons, labs, and projects with the use of text, sound, video, animations, chat

rooms, discussion boards, and links to additional resources. This study showed that the use of instructional technology at CPHS led to better grades and an improvement in the students' academic performance on state mandate exams. The use of instructional technology at CPHS supported the work of Tamim, Bernard, Borokhovski, Abrami & Schmidt (2011) that using instructional technology that was relevant to what was learned, in the classroom can improve student achievement.

Bakia, Means, Gallagher, Chen and Jones (2009) emphasized that sheer access to technology is not enough to influence student achievement, rather, technology must be used in ways that support students by providing resources that allowed them to experience learning in a variety of ways, thus increasing their opportunities for success in school, life and careers. In CPHS, the use of instructional technology allowed the students to experience learning by participating in online post-secondary classes, creating, and selling products, acquiring skills that led to jobs, to use computer software commonly used in business, and to earn credential that led to careers before they finished high school. These finding supports the work of Bakia, Means, Gallagher, Chen and Jones (2009) suggesting that if technology was implemented and used in an isolated rural high school to support students by providing resources that allowed them to experience learning in a variety of ways the use can led to positive outcomes.

Just like all public high schools, rural and non-rural, preparing student for success in school, college, careers and life was the ultimate goal of the school administrator. In an isolated rural high school like CPHS, the responsibility of preparing students for success

fall on the school administrators and staff. The lack of resources and support from the parents and the community made the task difficult without instructional technology. According to Gordon (2011), a critical component of education for rural districts with problems created by sparse and remote populations was instructional technology.

CPHS found methods to obtain the necessary funds to budget for technology, created the space, and enhanced the facilities to support the use of instructional technology. In addition, the CPHS supported the professional development of the teachers when using instructional technology for teaching and learning. The incorporation of instructional technology provided the resources that allowed students to feel comfortable and content with learning, choose, and plan a career path, and motivated the students to come to school and participate in learning. The students' advanced their learning, and were prepared to enter the workforce or college, and prepared for future innovations in technology. In combination with their leadership practices, instructional practices, and applicable technology, the school experienced other positive outcomes as well. Finding in this study revealed that the use of instructional technology contributed to the overall performance of the school. These improvements were evident in the school's accountability measures performance scores, which showed that CPHS was succeeding. These findings are supported by the work of Gordon (2011) suggesting that implementing the right kind of technology was an effective way to assure that students in rural areas got the same quality of education as their counterparts in urban and suburban schools.

## Conclusions

The aim of this study was to explain how the incorporation of instructional technology in an isolated rural high school could improve the school, thus student success. To accomplish that goal a main priority during the literature review for this research study was to provide a rich depiction of an isolated rural high school, and what it meant to be an isolated rural high school, and how student achievement interconnects to using instructional technology. Related to that effort it became necessary to establish the following. First, explain the potential impact of the physical, social, cognitive, and economic characteristics of the locality of the school and the population. Next, explain how instructional technology influenced the operation of the school. Then provide an explanation as to how using instructional technology impacted student achievement, and finally to show how the incorporation of instructional technology in an isolated rural high school enhanced the quality of education. Doing so allowed the researcher to create an understanding of how the connection between using instructional technology in an isolated rural high school promoted student achievement in school, college, careers, and life. The study concluded that:

The use of instructional technology in this isolated rural high school to enhance the operation of the school and address the needs of the students and their parents led to a change in the school environment and the attitudes and behaviors of the students, parents, teachers, and the community about the school and learning. According to King, Harner and Brown (2000) the integration of instructional technology had the ability to positively

impact the school climate, enhance motivation and the engagement in teaching and learning if the existing norms, values and cultures of the community were taken into consideration.

The use of instructional technology in an isolated rural high school to support the instructional practices of the school led to teaching that was more productive. The use of instructional technology to monitor and evaluate students and teachers' performance, disaggregate test data, allowed the staff to adjust the curriculum and find additional ways to teach, thereby supporting teachers in their effort to improve student achievement. According to Tamim, Bernard, Borokhovski, Abrami & Schmidt (2011) instructional technologies were more apt to improve student achievement, if teachers thoughtfully integrated the technology into the process of teaching and learning.

This study showed that using instructional technology in an isolated rural high school to support learning led to an increase in student productivity. According to (Means, 2010) technology needed to draw the attention of students; spark an interest in technology and learning, thereby, promoting learning, and motivating students to learn. The use of instructional technology in this isolated rural high school to access resources and support instruction and learning led to additional opportunities for students to be successful.

The use of instructional technology led to an overall improvement in the school performance. According to Campbell, Kepple, & Herlihy (2015) the level of satisfaction with using technology for teaching and learning was closely related to improvements in

attendance, drop-out rates, and an enhances feelings of self-efficacy, success with learning, which leads to an improvement in the school accountability.

### Contribution

This study made three major contributions to the literature on using instructional technology in an isolated rural high school. First, the study provides a view of the issues faced in isolated rural high school. Secondly, this study showed the extent to which instructional technology can be used in isolated rural high schools to address the school's overall performance. Finally, this study showed the extent to which, instructional technology, as a mode of instruction supported earning credits and the advancement of the students' education in remote rural high schools. Since, research in this area of using instructional technology in isolated rural high schools was relatively new and the related literature was limited (Hannum, Irvin, Banks & Farmer, 2009); Patrick & Powell, 2009); and Cavanaugh, Barbour, & Clark, 2009). Data from this study should enhance our knowledge and understanding of the influence of using instructional technology in isolated rural high school in educational practice.

### Reflection

This research study provided some key ideas to help examine professional practices, and guidelines for possible changes and improvements in future practices, as

well as contributing to a growing awareness of how using instructional technologies might affect the school and students' success.

### Relationship to Research

In examining, isolated rural high schools, a review of literature revealed that the quality of education was a concern for administrators and there was a dire need to implement changes to make the quality of education better, especially in isolated rural schools with a large minority and poor population (Strange, Johnson, Showalter, & Klein, 2012). CPHS served a large minority population (89%) and the majority of the school population are economically disadvantaged (98%) and qualified for free or reduced lunches, which influenced the quality of education and the success of the students attending school.

The characteristics of the locality of the isolated rural high school and the characteristics of the environment inspired the culture and lifestyle of the people who occupy the area, thus making the geographical location of the area, a pivotal characteristic (Kim, Rendon & Valadez, 2011). The attributes of the location of CPHS influenced the parents and their children way of thinking and acting about life, school, and education.

Because of the unique characteristics of isolated rural areas, operational problems existed such as funding, recruiting, and retaining teachers, community and parental involvement, motivation and technology (Abshier, Harris & Hopson (2011), and Yettick, Baker, Wickersham & Hupfeld, (2014). One operational challenge that indirectly linked

to other issues encountered by remote rural schools was funding. Funding was a catalysis that spearheaded addressing other challenges due to the lack of revenue needed to implement and obtain educational resources, support, materials, or supplies to manage the school. These findings are consistent with the work of Abshier, Harris, and Hopson (2011) and Yettick, Baker, Wickersham and Hupfeld (2014) that due to the location of the school, operational problems with funding, recruiting, and retaining teachers, community and parental involvement, motivation and technology were likely to influence the quality of education, thus student achievement.

The physical characteristics, social-cognitive abilities, the students' preference for course selection and method used to deliver instruction influenced the achievement of the students' in isolated rural high schools (Cleveland, Chambers, Mainus, Powell, & Skepple et al., 2012); (Lim, Kim, Chen & Ryder, 2008). Due to socioeconomic factors, the physical characteristics, the psychological and social skills, and the students' preference for what and how they want to learn, influenced their desire to be successful in school. These findings are supportive of the work of Cleveland, Chambers, Mainus, Powell, & Skepple, 2012); Lim, Kim, Chen & Ryder (2008) who suggested the characteristics of the students' attending isolated rural school affected their attitude and performance toward education and learning.

Providing students attending isolated rural high schools with additional opportunities to experience learning can lead to success. Using instructional technology for teaching and learning gained much popularity, especially in remote rural high schools

because technology allowed remote rural high schools to afford students opportunities for learning, that otherwise might not be possible (Allen & Seaman, 2011). CPHS incorporate instructional technology and provided the resources needed for students to; experience learning in a variety of ways and learning environments (classroom and labs), opportunities to expand their learning, and opportunities to participate in other educational initiatives. The findings were consistent with the work of Allen & Seaman (2011) that using instructional technology in isolated rural high schools offered students' opportunities for learning that led to success in school, college, life, and careers.

Isolated rural high schools with minority and deprived students had trouble providing a good quality education for the students. In essence, the responsibility of employing strategies for improving students' performance and the schools' quality of education, especially in isolated rural schools lay in the hand of the school administrator (Popham, 2009). CPHS employed strategies with the support of instructional technology that led to the school becoming more effective and proficient in their educational practices, thereby leading to an improvement in the school's accountability for students' learning. The findings are consistent with the suggestion of Popham (2009) that employing strategies in isolated rural high school can improved the students' performance, improved the quality of education the student received and the students and school performance on state mandate exams and other accountability measures.

## Implications for Policy and Practice

### Administrators

School administrators play an important role in the process of incorporating technology to improve schools located in isolated areas. Training for school administrators need to would need to encompass the development of strategies and goals for using instructional technology that addressed the norms, cultures, and values of the students and the families living in isolated rural areas. Professional development needed to include the implementation of relevant professional development that focused on the needs of the students, the development of an effective curriculum and instructional practices using instructional technology.

### Teachers

Teachers need training on how to integrate instructional technology into their classroom to modify their instructional practices.

### Policy Makers

Educational policy makers at the federal, state and local area must first identify the need and establish goals for using instructional technology in a remote rural high school for teaching and learning, considering the technological resources and materials. A plan to align the curriculum to the software programs and the technological devices are

necessary. Policymakers need to provide funding to help with the initial cost of establishing and acquiring the technology, as well as providing infrastructural costs.

### Limitations of the Study

Although, this study contained important implications for schools and school districts regarding the influence of instructional technology on the school and its impact on student achievement, there are limitations to this study.

1. Researcher bias was a limitation to the study because the researcher was an employee where the study was conducted and responsible for collecting and analyzing data.
2. A limitation of the current study was its generalizability because the scope of this study is limited to, research at only one isolated rural high school. Therefore, it was important to remember that one isolate rural high school may vary greatly from another isolated rural high school, whether by size or locality. For this reason, generalizations made from this study's results may not be applicable to others.
3. Due to resource and time constraints, there were a limited number of interviews. A higher number of interviews would have enabled the researcher to gain insight from other school personnel, such as teachers. However, this study was bound by time and place.
4. The validity of the current study was limited to the reliability of the instruments used and developed by the researcher. Three factors could affect

the reliability of data: (a) ambiguous interview questions, (b) unclear procedures in the administration of non-standardized instruments, and (c) participants not responding to questions honestly (Creswell, 2013).

### Delimitations

The current research study included interviews and observations from a selected school in the southern part of the United States. Only one isolated rural high school comprised the sample for the study. However, the accurate recording of data from a larger number of isolated rural high school and detailed analysis of data would be costly and time excessive. However, the sample of one isolated rural high school may represent the population of isolated rural high schools within the school district. Responses from the interviews and observations on the use of instructional technology in the school and classrooms for instructional purposes guided the study.

### Recommendations for Future Research

More research for the incorporation of instructional technology in an isolated rural high school is needed. Careful planning for the effective use of instructional technology aimed at promoting the achievement of the students is also needed. However, the researcher recommends future research:

1. More research on the acquisition and use of instructional technology in remote rural high schools.

2. An analysis of the effectiveness of instructional technology on the instructional practices of teachers in remote rural high.
3. Research concerning the best educational practice for administrators, when using instructional technology in the daily routine of remote rural high schools.
4. A comparative study of two or more isolated rural high schools with similar demographics, but different performance rating would be valuable to determine what technologies were introduced that were effective and the ones that were not.

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## APPENDICES

## APPENDIX A

### Concept Analysis Chart

Appendix A

Concept Analysis Chart

Topic: Rural Schools in America

Study	Purpose	Participants	Design/Analysis	Outcomes
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Redding & Walberg (2012)	Examines how some of the contentions make about rural school districts and communities are mistaken.	Rural school districts in America	Report/Informative	<p>Describes the condition of rural schools:</p> <ul style="list-style-type: none"> <li>• Isolated</li> <li>• Small population</li> <li>• Under-developed</li> <li>• Community involvement</li> <li>• Parental involvement</li> <li>• Funding</li> <li>• Poor infrastructure for technology</li> </ul>
Strange, Johnson, Showalter & Klein (2013)	Analyzes the context and condition of rural education in America.	50 states rural school districts	Report/Numerical/Quantitative Data Description	<p>Concluded that :</p> <p>Policymakers need to understand the challenges faced by rural school districts.</p>

Topic: Characteristics of Remote Rural Schools

Study	Purpose	Participants	Design/Analysis	Outcomes
-------	---------	--------------	-----------------	----------

Bell & Pirtle (2012)	Examines how low performing rural school districts can integrate the unique attributes and resources into the effort to improve schools	Rural school districts	Paper(Brief) /Content Analysis	<p>There is no proven, universal school improvement approach.</p> <p>Transformation in rural areas requires the integration of existing values, norms, and cultures of the community and school.</p> <p>Transformation process should involve the community, parents, students, educators, and stakeholders in all phases of the effort to change the school.</p>
Kim, , Rendon, , Valadez s (2012)	The authors looked at differences among 6 Asian American ethnic groups in terms of student-level and school-level characteristics and examined factors related to their educational aspirations	Asian American 10th graders in the sample was 973: 257 Chinese, 210 Filipinos, 151 Koreans, 67 Japanese, 188 Southeast Asians, and 100 South Asians	Scholarly Journal/ One-way analysis of variance (ANOVA) and Schaeffer's	Finding indicated a significant difference in regard to parent education and occupation.
King, Harner & Brown (2002)	Analyze the importance of rural education in each of the 50 states and calling attention to the urgency with which policymakers in each state should address rural education issues.	Rural school districts	Journal Article/ Qualitative narrative study	<p>Discuss challenges and importance of rural education</p> <ul style="list-style-type: none"> <li>• Socioeconomic challenges</li> <li>• Student diversity among rural students;</li> <li>• Rural educational policy</li> <li>• Educational outcomes</li> </ul> <p>Concluded that: Some rural districts are unique</p>

Topic: Factors Influencing the Operation of Remote Rural Areas

Study	Purpose	Participants	Design/Analysis	Outcomes
-------	---------	--------------	-----------------	----------

Abshier ,Harris & Hopson (2011)	Investigate the perceptions of successful small school superintendents in regard to maintaining or improving districts efficiency and financial status.	Superintendents in Texas	Narrative study/ Qualitative/Face to Face interviews	<p>Finding suggest to increase school revenues:</p> <ul style="list-style-type: none"> <li>• Understanding state's funding system</li> <li>• Look outside school districts for potential revenue</li> <li>• Accept transfer students to generate revenue.</li> <li>• Consider personnel</li> <li>• Reduce district spending</li> </ul>
Abrami, Benard, Bures, Boroshevski and Tamin (2011)	The purpose of the study was to explore both the challenges and skills needed to assume a leadership position.	Rural school principals	Journal Article/Narrative	<p>Outline challenges faced by principals in rural schools</p> <ul style="list-style-type: none"> <li>• Funding</li> <li>• Parent involvement</li> <li>• Community involvement</li> <li>• Teachers</li> <li>• Motivation</li> <li>• Resources</li> </ul> <p>Provide a plan to help principal's deals with the challenges they face.</p>
Epstein (2010)	Examined how rural high school students' self-perceptions and environmental perceptions influence their engagement, expectations, and achievement, and how those relationships differ by geographic rural location.	224 students in four rural, public high schools in two U.S. states, Colorado and Indiana	Journal Article/ Path models followed by multivariate regression analyses, and MANOVAs	<p>Findings suggest that rural high school students feeling about themselves, their environment influences there:</p> <ul style="list-style-type: none"> <li>• Engagement in learning</li> <li>• Expectations</li> <li>• Achievement</li> </ul> <p>Potentially important implications for rural high school students when it comes to resource management, administration, and teaching practice.</p>
Harde & Hennessey (2010)	The purpose of this study was to investigate the perceptions of successful small-school superintendents in regard to maintaining or improving district efficiency and financial status	Seven small school superintendents in Texas.	Qualitative, narrative study	<p>Identified challenges with:</p> <ul style="list-style-type: none"> <li>• Funding</li> <li>• Community involvement</li> <li>• Parent involvement</li> <li>• Teachers</li> </ul>

Topic: Factors Influencing Student Achievement

Study	Purpose	Participants	Design/Analysis	Outcomes
-------	---------	--------------	-----------------	----------

Baker, Means, Gallagher, Chen and Jones (2009)	This study examined technology implementation practices associated with student learning gains.	Teachers Administrators	Journal Article/ Interviews and observations	Findings highlight the importance of school practices in the areas of <ul style="list-style-type: none"> <li>• principal support</li> <li>• teacher collaboration</li> <li>• software use</li> <li>• classroom practices</li> <li>• school management.</li> </ul>
Barbour & Siko (2012)	Describes rural student in rural schools enrolled in online learning classes to graduate.	Rural school students	Case Study	Results showed a decline in productivity, limited by technology at home, and did minimum work
Cleveland, Chambers, Mainus, Powell & Skepple et al. (2012)	The purpose was to collect information that would assist the school to optimize student academic performance.	53 teachers 19 classified staff 4 administrators 105 students 27 parents	Qualitative study/ Case-study	Finding indicated that there is a need for further investigations on the effect of school culture on student academic achievement in rural areas.
Lim, Kim, Chen & Ryder (2008)	The purpose of this study was to investigate the effects of three different methods of instructional delivery (online instruction, traditional face-to-face instruction, and a combination of online and traditional instruction) on student achievement and satisfaction levels used in an undergraduate Wellness course at a Midwestern university.	One hundred fifty-three undergraduate students (71 men, 82 women; between the ages of 18 and 55 years.	A one-way analysis of variance (ANOVA) and Post hoc Scheffé multiple comparisons / A survey was developed to examine student demographics, student perceptions of online learning, and student satisfaction levels	Most students indicated that they would like to see an online option when enrolling for the course in the future. These findings suggest that a well-designed online course and a web enhanced residential course can be effective in teaching Wellness.
Song & Oh (2011)	Investigated the learning style preferences of learners who have diverse cultural	Sixty-five international students in Seoul, Korea.	Article/Questionnaire/ ANOVA/ MANOVA / post hoc Scheffé test	The results demonstrate significant cultural group differences in learning style preferences of learners of the Korean

Topic: Opportunities for Learning in Remote Rural Schools

Study	Purpose	Participants	Design/Analysis	Outcomes
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Allen and Seaman (2011)	Determine the underlying constructs that comprise student barriers to online learning.	Schools scale n=1,056	Article/ A factor analytic study	<p>Eight factors were found:</p> <ul style="list-style-type: none"> <li>• Administrative issues</li> <li>• Social interaction</li> <li>• Academic skills</li> <li>• Technical skills</li> <li>• Learner motivation</li> <li>• Time and support for studies</li> <li>• Cost and access to the internet</li> <li>• Technical problems</li> </ul>
Means (2010)	Examines technology implementation practices associated with learning gains.	Schools rural and non- rural	Qualitative/surveys ,interviews	<p>Distance and online learning:</p> <ul style="list-style-type: none"> <li>• Provide exciting opportunities for increasing the reach of education.</li> <li>• Reducing its cost.</li> </ul> <p>Increasing the quality of teaching and learning.</p>
Tamim, Bernard, Borokhovski, Abrami, & Schmidt (2011)	Focus distance learning and online learning.	Exploration of previous findings on distance and online learning	Journal article/ Study	Suggest how theory and other evidence may improve instructional practices.

Study	Purpose	Participants	Design/Analysis	Outcomes
Campbell, Kepple, & Herlihy (2015)	This study Investigate teachers' perceptions and usages of technology and make a comparison between rural, urban, and suburban settings.	Educators Researchers	Journal / Article/Content analysis	Using technology in educational settings can provide many instructional benefits, especially, the potential to develop of learning skills.
Gordon (2011)	Discusses technology in rural schools in the U.S	Rural School Administrators	Book	Suggested that: There is a need to make sure students in rural areas experience the use of technology.  Technology is a way to assure that rural schools provide students with a highly qualified education.
Popham (2009)	Examines the use of assessment in education.	Administrators Educators	Book	Concluded that: Testing for accountability should include more than just testing the students cognitive skills or content knowledge  The other attributes of the students need assessing.

## APPENDIX B

### Data Collection Plan

## Appendix B

### Data Collection Plan

Questions Research	Instrument	Source(s)	Who/What	Purpose
Given the relative isolation and limited access to resources faced by rural, isolated high schools to what extent, does the use of technology influence the operation of the school?	Researcher	Memos	Site Administrator	To gather information about the site; provide a rich description of the site.
	Documents	<ul style="list-style-type: none"> <li>• Site Web Page</li> <li>• School Handbook</li> <li>• Pre- existing surveys</li> <li>• School Newsletter</li> <li>• School Strategic Plan</li> </ul>	Site Administrator  Student Information System	Create reports
	Observation	Field Notes	Site	Site environment, facilities
	Interview	Memos	Site Administrator	Share concerns, facts, and opinions about yourself and the site.
	Documents	<ul style="list-style-type: none"> <li>• School Improvement Plan</li> <li>• Title I Plan</li> <li>• School Strategic Plan</li> </ul>	Site Administrator	Create Reports
	Interview Protocol	Memos	Site Administrator	Describe the use of technology at the school.

To what extent does the use of technology in isolated rural high schools impact students' achievement?	Documents	<ul style="list-style-type: none"> <li>• School Accountability Report</li> <li>• County Census Report</li> <li>• Title One Plan</li> <li>• Technology Plan</li> </ul>	Site Administrator  State Department of Education Website	Create Reports
	Interview Protocol	Memos	Site Administrator	Describe how technology, is used for teaching and learning?
	Document	<ul style="list-style-type: none"> <li>• Technology Plan</li> <li>• School Strategic Plan</li> <li>• State School Report Card</li> </ul>	Site Administrator	Create Reports
	Observation Protocol	Field Notes	Site	Technology
	Interview Protocol	Memos	Site Administrator	What are the outcomes of using technology for managing the school and as way deliver instruction?
	Documents	<ul style="list-style-type: none"> <li>• School Improvement Plan</li> <li>• Title I Plan</li> <li>• Curriculum Guide</li> <li>• School Strategic Plan</li> <li>• State School Report Card</li> </ul>	Site Administrator	Create Reports
	Observation Protocol	Field Notes	Site	Classrooms Computer Labs

	Archival records	<ul style="list-style-type: none"> <li>• Class demographic reports</li> <li>• Sample schedules</li> <li>• Course enrollment size</li> <li>• Class attendance report</li> <li>• Class rosters</li> <li>• Final grade reports</li> </ul>	Student Information System	<ul style="list-style-type: none"> <li>• Generate descriptive statistics of enrollment by age, gender, ethnicity, course preference, delivery model</li> <li>• Collect facts about student performance in classes using instructional technologies on physical characteristics of the sample.</li> <li>• Generate group descriptive statistics by ethnicity, course enrollment, of the final grade of the group and percentages</li> </ul>
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## APPENDIX C

### Data Collection Timeline

## Appendix C

### Data Collection Timeline

Instruments	
Conduct Interviews and Observations	December 2015- January 2016
Interview (unstructured)	
Observation (unstructured)	
Interview (semi-structured)	
Interview (semi-structured)	
Observation (semi-structured)	
Interview (semi-structured)	
Observation (semi-structured)	
Collect Documents	February- March, 2016
Site Web Pages, Site Accountability Report, School Newsletter	
State School Report Card	
County Census Report	
Preexisting survey results	
School Improvement Plan,	
Technology Plan	
Title I Plan	
Curriculum Guide, Student Handbook	

School Strategic Plan	
Site Master Schedule	
Collect Archival Records	April - May, 2016
Class Rosters	
Schedules	
Course enrollment size	
Class attendance reports	
Class final roster reports	
Final grades	

APPENDIX D

Interview Protocol

Appendix D

Interview Protocol

Part I

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Duration: \_\_\_\_\_

Interviewer: \_\_\_\_\_ Interviewee: \_\_\_\_\_

Hello \_\_\_\_\_. Thank you for consenting to cooperate in this study on using technology in remote rural high schools to promote student achievement. First, let me reiterate the purpose of the study. The purpose is to get a deeper understanding of how using technology in relative isolate rural high schools influences the operation of the school and affects student achievement. The interview will consist of a series of questions that will help with collecting the data need for the study. Please provide detail answers. Notes will be taken during the interview.

Do you have any questions? First, you will be asked some questions to help describe the use of technology at the school.

Question 1. Describe how technological devices are used in the school?

- a. Give examples.
- b. How are they used?

Question 2. What procedures are in place to access these devices?

- a. How often are they accessible for teachers and students to use?
- b. Are there a sufficient number of devices to use for teaching and learning?
- c. Why or why not?

Question 3. How often does the school experience equipment malfunction?

- a. network errors
- b. log in errors
- c. broken equipment

Question 4. What type of assistance is available to help troubleshoot when issues arise with technological devices?

## Interview Protocol

### Part II

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Duration: \_\_\_\_\_

Interviewer: \_\_\_\_\_ Interviewee: \_\_\_\_\_

Hello \_\_\_\_\_. Thank you for consenting to cooperate in this study on using technology in remote rural high schools to promote student achievement. First, let me reiterate the purpose of the study. The purpose is to get a deeper understanding of how using technology in relative isolate rural high schools influences the operation of the school and impact student achievement. The interview will consist of a series of questions that will help with collecting the data need for the study. Please provide detail answers. Notes will be taken during the interview.

Do you have any question. During this interview, you will be asked some questions to help describe the use of technology for teaching and learning at the school.

Question 5. Describe the ways technological devices are used for instruction?

Question 6. How are technological devices used for instruction were aligned with the school district's curriculum?

Question 7. How do students feel about using technological devices for instruction?

Question 8. What kind of support was given to students using technological devices for learning academic subject content?

- a. Give examples of specific supports?
- b. Describe how support was made available to students?

## Interview Protocol

### Part III

Date:\_\_\_\_\_ Time: \_\_\_\_\_ Duration:\_\_\_\_\_

Interviewer:\_\_\_\_\_ Interviewee:\_\_\_\_\_

Hello \_\_\_\_\_. Thank you for consenting to cooperate in this study on using technology in remote rural high schools to promote student achievement. First, let me reiterate the purpose of the study. The purpose is to get a deeper understanding of how using technology in relative isolate rural high schools influences the operation of the school and impact student achievement. The interview will consist of a series of questions that will help with collecting the data need for the study. Please provide detail answers. Notes will be taken during the interview.

Do you have any questions? During this interview, you will be ask about the some questions to help explain the outcome(s) of using technology at the school.

Question 9. What are the outcomes of using technology for managing the school?

Question 10. What are the outcomes of using technology to deliver instruction to students?

## APPENDIX E

### Observation Protocol Form

Appendix E

Observation Protocol Form

**Instructions:** Observe and hand record response(s) only for items actually seen by the observer in the space provided.

Observer(s) \_\_\_\_\_

Type of Observation: \_\_\_\_\_ Observation # \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Place \_\_\_\_\_ Duration \_\_\_\_\_ (mins)

Observed	Description
Who/What	
Setting	
Behavior	
Dialogue	
Activity	

Event	
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APPENDIX F

Letter of Cooperation

MITCHELL COUNTY SCHOOL SYSTEM  
108 SOUTH HARNEY STREET  
CAMILLA, GA 31730  
(229) 336-2100

August 15, 2016

Dr. Michael D. Richardson, EdD  
Director of Doctoral Program in Curriculum & Leadership  
Callaway Endowed Chair of Educational Leadership  
Jordan Hall 105  
Columbus State University  
Columbus, GA 31907

Dear Dr. Richardson:

Eva Jenkins has requested permission to collect research data from the 2015-2016 school year through a project entitled INSTRUCTIONAL TECHNOLOGY: AN ALTERNATIVE SOLUTION TO PROMOTING ACHIEVEMENT IN REMOTE RURAL HIGH SCHOOLS.

I have been informed of the purposes of the study and the nature of the research procedures. I have also been given an opportunity to ask questions of the researcher.

As a representative of Mitchell County High School System, I am authorized to grant permission to have the researcher Eva Jenkins collect archival data (i.e., 2015-2016 class demographic report, class rosters, class schedules, course enrollment size, attendance reports, and final grade report.

The researcher has agreed to provide a copy of published conclusions or results.

If you have any questions, please contact me at 229-336-2100 or  
Robert\_adams@mitchell.k12.ga.us.

Sincerely,

Robert Adams, Superintendent

## APPENDIX G

### IRB Approval

## Appendix G

Institutional Review Board  
Columbus State University

Date: 11/9/16

Protocol Number: 17-007

Protocol Title: Instructional Technology: An Alternative Solution to Promoting Achievement in Remote Rural High Schools.

Principal Investigator: Eva Jenkins

Co-Principal Investigator: Michael Richardson

Dear Eva Jenkins:

The Columbus State University Institutional Review Board or representative(s) has reviewed your research proposal identified above. It has been determined that the project is classified as exempt under 45 CFR 46.101(b) of the federal regulations and has been approved. You may begin your research project immediately.

Please note any changes to the protocol must be submitted in writing to the IRB before implementing the change(s). Any adverse events, unexpected problems, and/or incidents that involve risks to participants and/or others must be reported to the Institutional Review Board at [irb@columbusstate.edu](mailto:irb@columbusstate.edu) or (706) 507-8634.

If you have further questions, please feel free to contact the IRB.

Sincerely,

Amber Dees, IRB Coordinator

Institutional Review Board  
Columbus State University

## APPENDIX H

### Initial Contact

## Appendix H

### Initial Contact Script

Excuse me, Mr./Mrs.\_\_\_\_\_

If possible, Can I speak with you?

I am working on my Doctorate Degree in Education at Columbus State University. As a part of the requirements, I have to complete a dissertation.

I have been granted permission to conduct a study at the county high school.

I am approaching you to see if you are willing to take part in the study.

As the head administrator of the county high school, I believe you can provide valuable information that will help me with my research project.

If you are willing to participate in the research project, I will need you to allow me to conduct four interviews with you, make three observations at the school, and provide documents and archival records maintained here at the high school.

Are you willing to participate in the research study? (Pause for questions and a response)

If the response is “no, not interested” I will stop and say thank you.

If yes, I will say, Thank you and I will stop by at a more convenient time to keep you informed.

## APPENDIX I

### Follow Up Script

## Appendix I

### Follow Up Script

Excuse me, Ms/Mrs\_\_\_\_\_

Do you have a minute?

I stopped by to follow up on the conversation we had regarding my research project and confirm that you are still interested in participating in the study.

- If individual says “no, not interested” I will say thank you.
- If he/she confirms their verbal consent to participate; we mutually agree on and schedule a time to meet in person and discuss the research project: purpose, design, methodology, and informed consent.

## APPENDIX J

### Informed Consent

## Appendix J



# COLUMBUS STATE UNIVERSITY INSTITUTIONAL REVIEW BOARD

## **Informed Consent Form**

You are being asked to participate in a research project conducted by Eva Jenkins, a student in the College of Education and Health Profession, Department of Counseling, Foundations and Leadership at Columbus State University. The faculty member supervising the project is Michael D. Richardson, EdD.

### **I. Purpose:**

The purpose of this research project is to explain how using technology in a relatively remote rural high school with limited access influence the operation of the school and impact student achievement in school, life, college and careers.

### **II. Procedures:**

As the head administrator of the school in charge of the total operation of the school, you will be asked to participate in interviews. Four interviews will be conducted by the researcher, in your office, after school, lasting no longer than thirty minutes will be conducted during a mutually agreed on time. You will be asked some questions regarding the school, technology and how you use technology in the school. You will be asked to allow the researcher to conduct three observations at the school focusing on the school facilities, size and location, the type of technology the school has acquired and when, where and how the technology is used in the school. These observations will last no longer

than thirty minutes and one will take place before the school day begins and the other two during the school day. You will be asked to provide access to documents and archival records maintained at the school regarding the operation of the school. Notes will be hand written during the interviews and observations by the researcher. No audio or video tapes will be made. Faculty and other administrators at the school will neither be present at the interview nor have access to raw notes. These precautions will prevent my your individual comments and your responses from having any negative repercussions.

### **III. Possible Risks or Discomforts:**

There are no anticipated risk, although, there is a slight chance of being uncomfortable or embarrassed while answering interview question, however; if you feel uncomfortable in any way during the interviews sessions You have the right to decline to answer any questions or to end the interview.

### **IV. Potential Benefits:**

You understand that the only potential benefit of the research project is to gain knowledge and understanding about an event. The research project can have a potential benefit for educators wanting a better understanding of using technology for instruction. They may use the information to modify their instructional practices.

### **V. Costs and Compensation:**

You understand that you will not receive any payment for my participation in this research project. The researcher does not have any vested interest in the outcome of the study other than to provide information.

### **VI. Confidentiality:**

You understand that the researcher will not identify you by name using data obtained from interviews, observations, documents or archival records and my confidentiality as a participant in this study will remain secure. The use of records and data will be subject to policies that protect the use of data and the anonymity of individuals and institutions. If the results of the research project are published or discussed in conferences, no information will be included that would reveal your identify or the institution. Data containing personal identifying information will be destroyed by the researcher. The data will be stored on a computer in the researchers' office, which is password protected, and on a flash drive as a backup, which will be stored in a locked filing cabinet in the researchers' office. The data will be stored for approximately five years after the study has been completed and then destroyed

**VII. Withdrawal:**

Your participation in this research study is voluntary. You may withdraw from the study at any time, and your withdrawal will not involve penalty or loss of benefits.

For additional information about this research project, you may contact the Principal Investigator, Eva Jenkins at 229-336-0970 or [jenkins\\_eva@columbusstate.edu](mailto:jenkins_eva@columbusstate.edu). If you have questions about your rights as a research participant, you may contact Columbus State University Institutional Review Board at [irb@columbusstate.edu](mailto:irb@columbusstate.edu).

You have read this informed consent form. If you had any questions, they have been answered. By signing this form, you agree to participate in this research project.

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Signature of Participant

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Date

## APPENDIX K

### Primary Codes

## Appendix K

### Primary Codes

Codes	Meaning of Code
RS	Rural Schools
ARRS	Attributes of Remote Rural Schools
IOS	Influence Operation of School
ISA	Influence Student Achievement
OL	Opportunities for Learning

SA School Accountability

## APPENDIX L

### Secondary Codes

Appendix L

Secondary Codes

Meaning of Code

Codes	
Codes	
CRRS	Characteristics of Remote Rural Areas/Schools
ORRS	Operating Remote Rural Schools
ISA	Influence on Student Achievement
IT	Instructional Technology

SA

School accountability

APPENDIX M

Codes for Emergent Themes

Appendix M

Codes for Emergent Themes

Meaning of Code

Codes

CRRS

Characteristics of Remote Rural Areas/Schools

ORRS	Operating Remote Rural Schools
ISA	Influences on Student Achievement
IT	Instructional Technology
SA	School accountability